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NOTICE TO BINDER.

Volume LII has been issued in two parts, each containing the "Journal" proper, paged with Arabic figures, and "Extracts from the Proceedings" paged with Roman figures. This title and contents sheet should be placed first, and be followed by pages 1 to 152, then by pages 153 to 320. After that should come "Extracts from the Proceedings," pages i to lxxvi, and lxxvii to cxxix, concluding with the Index.

JOURNAL

OF THE

ROYAL HORTICULTURAL SOCIETY.

VOL. LII. PART I. 1927.

THE GARDENS AT LOGAN.

BY KENNETH McDOWALL, F.R.H.S.

THE situation of Logan Garden is very favourable to the welfare of delicate sub-tropical plants. Being on the south-west coast of Scotland and surrounded by the sea on three sides the climate is mild and a hard frost rarely if ever occurs. To the south is the Mull of Galloway, at the extreme end of the narrow peninsula upon which the garden lies. A mile to the east is the Bay of Luce ; about the same distance to the west is the rock-bound coast of the Irish Sea.

In stormy weather a drift of salt spray is carried across the narrow strip of land. When the sun is shining and the wind high the spray is sometimes quite perceptible. Is this beneficial to plants ? Certainly it does them no harm. The garden is sheltered from the prevailing westerly winds, which frequently reach gale force during the winter months. The average rainfall is 40 ins., and any month may be the wettest. The garden itself is within high old gray stone walls. It was just an old-fashioned Scottish garden in years gone by, where everything grew side by side, vegetables, fruit, and flowers, and it is a very ancient garden.

The soil consists of a light loam of some depth. Fortunately, owing to its large extent, some old trees were left standing, such as sycamore, lime, elm, flowering ash, and wild cherry. These, together with several pines, Portugal laurels, apple and pear trees, have been carefully preserved and the garden laid out little by little over a great

many years. Every natural feature within the walls has always been taken advantage of. It is impossible to over-estimate the value of trees in a large garden; they take away all formality, a pleasing background is provided, and the shadows cast on a summer's day enhance the beauty of the surrounding colour. They also give shelter, and the space left to them is not grudged. There is a very old clipped Beech hedge of considerable length right across the centre of the garden, about 18 feet high and 10 feet through. No better shelter could have been found, or any that looks nicer at all times of the year. There are many gardens within the garden, each one leading into another, and often well hidden from its neighbour; in these sheltered places the rarer plants grow. There are large herbaceous borders backed by the old walls.

Roses have their place, with a grass walk in the centre, and a yew hedge behind them. On a terrace built with peat the dwarf high-alpine Rhododendrons from China grow. These small plants require care and must be kept clear of weeds; some of them creep along the ground only a few inches high: they should always be placed in an open situation, with all the light and air possible. They seem to like sunshine, so long as the roots are kept cool and moist. The peat terrace was made specially for these brilliant-flowered little Rhododendrons, so that they may be seen and appreciated. There are six terraces, with walls 18 inches high, built of peat cut from the bog in large slabs and placed one on top of the other when wet. A walk leads up through the centre of the terraces, dividing them into two portions, with a small path at the foot of each peat wall. The borders, 12 feet wide, vary in length from 20 to 40 feet. Each species of Rhododendron is planted thickly together, and all were raised from seed collected by FORREST and by FARRER in China. Lilies, Meconopsis, Primulas, and a few other plants are grown among them. The peat walls seem to keep the borders moist and at the same time give sufficient drainage; at any rate all the plants thrive under such treatment.

Nomocharis pardanthina has established itself here, and flowers well every year. Last summer some of the bulbs produced six flowers, others had from three to four, and grew 2 feet high, and self-sown seedlings have appeared. A rock garden is in the formation of a small valley with a little stream of water winding down the centre; on either side natural rock slopes upward. The places where plants can find a roothold are naturally limited, owing to the solid nature of the rock, and it is only where stones have been introduced to form pockets that they can grow at all. Near the main entrance to the garden lies an open space liberally covered with stone chips over deep loam, and fully exposed to the sun, surrounded on three sides by a low yew hedge. This experiment has proved successful; each plant or group is given plenty of space in which to grow, and the stone covering enables one to walk among them. The grey colour shows off the flowers to perfection, and weeds do not come up much among

the chips. Lilies, Tigridias, and other bulbs, *Dierama pulcherrimum*, and herbaceous Lobelias are among those that appreciate this place all the year round. The water-lily tank near the centre of the garden gets the sun all day, and here Latour Marliac's hybrid Nymphaeas grow and flower from May till October. Each plant has a clear space of water round it, for this is necessary to display the full beauty of these wonderful aquatics (fig. 1). If they are allowed to grow into one another their charm is lost. *Richardia africana*, the big white Arum, grows 4 feet high at the edge of the water. A little distance away is a small heated tank where the blue-flowered tropical water-lilies raise their lovely flowers 12 inches above the surface of the water. A short avenue of *Arundinaria nobilis* leads into another little garden. About twenty years ago this bamboo flowered simultaneously all over Europe, and consequently died, as it did here that year, and in all other districts in this country where it was grown. The plants that are now growing in the garden are from self-sown seed which came up in quantity after the death of the parent. Now there comes into view a thriving specimen of *Arundinaria insignis*, waving its 20-foot canes loaded with pale-green foliage in the wind, and a group of *Alocasia macrolisa*, the large leaf of which resembles the ear of an elephant (figs. 2, 3). The seed of this plant was collected in China by FARRER at an altitude of 6,000 feet, and though not hardy it has stood outside for four years with some winter protection. The flowers resemble an Arum and are yellow, but its beauty is in the enormous leaf, 40 inches by 27 inches. Behind these stand three large tree-ferns, *Dicksonia antarctica* (fig. 4), and two plants of *Rhododendron sinogrande* with leaves 28 inches long. The highest point in the garden is commanded by the ruin of the old Castle of Balzeiland, below which is a rose border and grass walk. From this three stone terraces recently made occupy the steep slope underneath.

Mesembryanthemums of different kinds have been planted in holes in the wall near the old Castle, where they bloom splendidly every year (fig. 5). The flowers are so beautiful with their satiny sheen and the colours so vivid, embracing yellow, orange, scarlet, magenta, pink, and white, and produced in such masses that they should not be missed wherever it is possible to grow them. More will be planted in the new terrace walls below the Castle. Sunshine and sharp drainage are essential; they will not succeed planted on ground-level.

Cordyline australis is a feature in the garden. Sixty-two form an avenue planted in double lines on each side of a grass walk (fig. 6); they were raised from home-ripened seed and planted out in 1913 when a couple of feet high, and they now stand nearly 30 feet and are all well branched, so that their tops meet above the walk. In July the large flower-spike is produced covered with myriads of small sweetly scented cream or white flowers, lasting for a considerable time; these are followed by a pure white berry about the size of a small pea (fig. 7). If the spike of fruit is cut at Christmas-time it will last in water for many weeks. *Cordyline australis* is very quick-growing here until it flowers,

after which it begins to branch out, and it is then that the plant assumes its most striking appearance, often carrying many heads of bloom. Several species of *Eucalyptus*, now large trees, are conspicuous inhabitants of the garden (fig. 8). *E. Globulus*, grown from seed ripened outside here, is 60 feet high, and flowers every year in July. In a young state *E. Globulus* is delicate, but once hard wood is formed it seems to be perfectly hardy. The wood is brittle and branches often break off in the winter, but so vigorous is the growth that by the following autumn the trees have quite regained their normal appearance. The largest has a circumference round the trunk of 5 feet 1 inch, three feet from the ground. Surrounding the garden are shrubberies and woodland in which many Himalayan and Chinese *Rhododendrons* and other plants find a home. Having described the garden generally we may follow its course through the months.

February.—In the steeply sloping *Rhododendron* wood on the south side of the garden, *R. Hookeri*, 10 feet high and 11 feet across, is at its best. Well furnished to the ground, it has ninety fully expanded trusses out and many buds still to open. The flower is very waxy in texture, the colour an intense and indescribable scarlet, different from any other red-flowered *Rhododendron*. "While they are with us we learn our best lesson about colour from the flowers, for each colour has a flower which shows it at its best, but the flower blooms into that colour only to fade." Looking at *R. Hookeri* with its dazzling flowers standing out against the dark background of deciduous trees, it is easy to realize how true this is. It is still a rare plant in cultivation, though introduced so long ago as 1850 by Sir J. HOOKER from the Indian Himalayas. *R. lutescens* is in full flower, and though the blooms are small they are freely produced, and the yellow colour is good. Two large plants of *R. Nobleanum*, 15 feet high, have been in bloom since early January. A little *Rhododendron* of Dutch origin, known as "Silberrad's Early," 4 feet high, must not be forgotten, for when in bloom during January and February it is so smothered with pink flowers of good and long-lasting quality as almost to hide the foliage. In the garden *Iris unguicularis* continues to open hundreds of flowers, in spite of the quantity cut for the house almost daily since the new year. *Genista fragrans*, 12 feet 6 inches high, is flowering freely, later this year than usual; it often flowers throughout the winter. *Phormium tenax*, the New Zealand flax, planted singly or in clumps, is one of those that look their best in winter, though in summer when the large spikes of dark-red flowers are out it is beautiful. It can be placed almost anywhere; slow in the early stages from seed it makes good headway after the first few years. Snowdrops are at their best this month and cover the ground everywhere under the trees with a mantle of white, commencing to flower early in January whatever the weather conditions may be. They must have been established here for a very long time.

March.—Many *Rhododendrons* are now flowering in the shrubbery and woodland. *R. sutchuenense*, with its substantial clear pink



FIG. 1.—WATER-LILIES AT LOGAN.



FIG. 2.—ALOKASIA MACROLISA.



FIG. 3.—*ALOCASIA MACROLISA*.



FIG. 4.—DICKSONIA ANTARCTICA.

unspotted flowers and good foliage, is perhaps a better thing than its near relative *R. praeevernum*, which has large white flowers with a deep maroon blotch; these among the earlier arrivals from China have had time to grow into large plants and so show their value. Among the red-flowered species *R. barbatum* and *R. Thomsoni* are conspicuous objects. Many large plants of *R. arboreum* are fast coming into flower; those with deep coloured blooms of a pink or salmon shade and the pure whites are the most attractive. Their upright and rather thin habit of growth adds much to the beauty of the plant, for the rough-barked trunks and branches are not hidden by the leaves. In the garden *Euphorbia mellifera*, a very large plant 10 feet high and 48 feet in circumference, is a handsome shrub with its large light-green leaves and quantities of quaint brick-red flowers. Neither is *E. Wulfenii* to be despised, an evergreen of bushy habit with dark foliage and handsome yellowish flower-bracts: both remain in flower for a long time. In the peat terrace *Rhododendron repens*, only a few inches high, creeping along the ground, has a few of its large scarlet trumpets open; beside it *Primula melanops* with deep violet flowers and a beautifully marked black eye looks well. *Erica arborea*, always smothered with strong-scented white flowers, is a nice plant at this time of the year; it sows itself in all kinds of unexpected places. In the rock garden *Rhododendron ciliatum* is in fine bloom and many plants of *Primula denticulata* are at their best.

April.—In the shrubbery which leads from the house to the garden there are some fine specimens of *Rhododendron Russellianum*, brought here from Ireland about 1860. During April and early May it is certainly the most conspicuous object in the landscape, for it has been liberally planted; the bright crimson-red flowers freely produced on the large plants, most of them about 30 feet high, can be seen from a long way off. So tall is this tree-like *Rhododendron*, and so spreading the branches, that at one place in the avenue they meet across the road with plenty of room to pass underneath in a car. Some of the large trunks have a circumference of nearly 4 feet. *R. Luscombeanum* has nice large crimson-lake flowers. *R. campylocarpum*, when doing well, is a free-flowering species, and one of the best. Eleven plants of *Dicksonia antarctica*, spreading their wonderful fronds high above the mossy grass of the shrubbery, were planted many years ago and have proved hardy, though the precaution is taken of covering the trunks with straw each winter. The fronds do not get browned with frost. There are others; the tallest one is in the garden and has a trunk 8 feet 6 inches high with a girth of 4 feet. It was planted out more than twenty years ago. From this plant, presumably, since it is the nearest, spores have blown to the peat terrace, where hundreds of young ferns of this species have made their appearance in the peat walls, and are growing well, having withstood several winters. Some are now large enough to move into other places. One *Dicksonia antarctica* in the woodland has a diameter of 16 feet across the fronds. *Sciadopitys verticillata*, the Umbrella Pine of Japan, 20 feet high and

well branched to the ground, a thriving specimen, has growing in front of it a good lavender-coloured *Rhododendron Augustinii*. *Berberis Darwinii*, an old-fashioned plant from Chile, is quite the best of its family as far as the flower is concerned, and cannot be dispensed with. The dark-green foliage and true orange-coloured bloom is beautiful on an old specimen. The peat terrace in the garden is at its very best just now; each border is a show of colour, as all the dwarf Rhododendrons more or less are in full beauty. The colours are varied and bright. *R. propinquum* is the shade of a violet bloom, *R. calostrotum* pink, three of the lapponicum series purple, lavender, and yellow, and all are in full bloom. *R. cyphocalyx*, just beginning to open its orange-brown flowers for the first time, promises to be a beautiful dwarf rivalling *R. dichroanthum*. Here and there the blood-red of *R. haematodes* and *R. neriflorum* gives a colour not to be found in the high-Alpine section. The azure flowers of *Meconopsis simplicifolia* raise themselves on stout stems high above the dwarf Rhododendrons. Adjacent to the top of the terrace *R. arboreum* in salmon and pink shades is also out. In the high woodland many Rhododendrons are flowering. This year the bloom on all the plants is exceptionally good. *R. Falconeri* has some very large trusses measuring $11\frac{1}{2}$ inches in diameter, with individual flowers $2\frac{3}{4}$ inches across, and twenty-three bells on the largest head. *R. 'Dr. Stocker'* is in full beauty; *R. fulvum* and *R. habrotrichum* are both good, the latter especially noteworthy, the flower a clear pink with a deep blotch in the centre and curious crimson, very hairy flower stalks and bracts. One plant of *R. Augustinii* is nearly blue, but not quite. *R. Wightii* in its best form is a showy Himalayan species, but of thin growth. *R. argenteum*, 15 feet high, has a spread round the branches of 46 feet, and here at any rate is of rapid growth.

May is perhaps the most beautiful month in the year, though June runs it close. It is now that a wealth of colour meets the eye in all directions, the pale green of the young leaves on the trees, a green of many shades which does not yet hide the branches or cast too dense a shade anywhere, but allows the sunlight to flicker all day on the many Rhododendrons in flower in the woodland and shrubberies. *R. Aucklandii*, with its large lily-like pure white flowers, is possibly the finest of all. *R. oreotrephes*, of a delicate soft lavender shade, with glaucous foliage, is one of the best of the small-flowered Chinese species (fig. 9). *R. Keysii*, covered with long narrow orange trumpets, full of honey, has grown 12 feet high. The large pale-green buds of *R. Dalhousiae* will soon open into yellow flowers, fading into almost white before going over; this fine Indian species does well here in shady places and always flowers. *R. Maddenii* is covered with strongly scented waxy blooms. Many forms of *R. decorum* are out, all beautiful. In the rock garden the powerful scent of *R. Edgeworthii* is wafted on the wind, calling attention to the plant before it is seen. This Himalayan Rhododendron is a better thing than its Chinese representative, *R. bullatum*. A curious dwarf Chinese Rhododendron,

only a few inches high, in the peat terrace is *R. tapienum*, bearing single campanulate flowers on a 2-inch stalk, just the colour of a Black Hambro grape, with the same powdery bloom on the outside of the petals, but when the sun shines through the flower it shows dark chestnut. *R. myrtilloides* is another of the same quaintness, but with pink bells. A very large plant of *Choisya ternata* guards one of the entrances to the rock garden. 'Pink Pearl' and 'Alice' are two good pink *Rhododendron* hybrids out just now, showing up well at a distance. In the garden the rose-borders are brilliant with Darwin Tulips planted in lines between the Roses. When the tulips are over they will be cut down, leaving only two leaves to each, so as to insure the bulbs ripening to flower a second year, after which they require renewing. *Calceolaria violacea* grows remarkably well, best, possibly, against a north or east wall. It is never touched by frost, and has grown over 6 feet high; it is not tied in, but allowed to grow naturally. Commencing to flower early in May, it continues for a long time, almost hiding the foliage with thousands of little purple heavily spotted bells. Moisture it must have. A very nice little everlasting is *Helichrysum bellidioides*, with neat foliage and pure white flowers, from New Zealand, which quickly spreads over the ground. Another plant from the same land is *Clianthus puniceus*, growing against a high wall, with bright-red flowers hanging in bunches below the fern-like leaves; the branches grow out from the wall many feet, displaying well the wonderful racemes. The flowers of the white form, really a pale green, are also attractive. The *Clianthus* is not a long-lived plant, seven or eight years sees it in its old age; easily raised from seed or from cuttings, it is of quick growth, and soon begins to flower. All the *Pittosporums* are worth growing for their foliage alone. *P. Buchanani* has dark chocolate flowers, and *P. eugenoides*, 15 feet, is of high excellence, with fragrant yellow flowers in large bunches. *P. Delli* is distinct, with sharply toothed leaves, and though growing strongly has not yet flowered. Primulas are now at their best; they grow everywhere. The little stream running through the rock garden is lined with self-sown plants growing in the cracks in the rock close to the water, where seed has lodged, though of soil there seems to be none. *P. japonica*, *P. pulverulenta*, *P. Beesiana*, *P. Bulleyana* and *P. helodoxa* all grow luxuriantly; some of the Lissadell hybrids raised in Ireland are beautiful, embracing many shades of red and orange, but these do not seed, with the exception of 'Red Hugh,' which reproduces itself, coming true to colour. *P. Cockburiana*, once planted, seeds itself sparingly. *P. sikkimensis* does well, but, so far, has not increased. An interesting example of how a plant can establish itself when the conditions are favourable may be seen just now in the glen which leads from this garden westward to the sea. There *Primula japonica* and *P. pulverulenta* are growing in unbroken masses for a distance of half a mile, right down from the top of the hill to the sea, on both sides of the path, so thick that they form a solid sheet of colour. *P. japonica* runs from a deep ruby through all shades of pink

to white and salmon. *P. pulverulenta* holds its own with *japonica*, keeping usually to its own colony ; it sometimes has as many as nine tiers of bloom, growing 5 feet high. WILSON, who introduced this plant from China, when he saw it growing here in the glen shortly before he left for America, remarked that it grew with greater luxuriance than in its native habitat. These Primulas are entirely self-sown, the offspring of a few seeds originally planted near the top of the hill. The seed, no doubt, has been carried down by water. Now that there is no longer any room for more plants below, they are moving upwards, though slowly, into the woods, where they intermingle with the wild blue Hyacinth, one of our most beautiful natives. At the foot of the glen a stone archway frames a heather-clad headland and the sea. The path continues a little farther on to the fish-pond, where tame cod and other sea-fish are kept. On the rocky sides of this salt-water tidal pool Mesembryanthemums fall 18 feet over the rocks, down almost into the water, and at a time of extra-high tides their long growths float out on the surface of the water like a piece of sea-weed, falling gently back on to the rocks when the tide recedes. It does them no harm even if the roots are covered with salt water, which sometimes happens. Incidentally, the fish-pond is a large pool 9 feet deep at low-water ; a natural cleft in the high rock 50 feet in length carries the tides into the pool which the fish inhabit ; a dry dyke is built of large stones across the cleft, allowing the water to flow and preventing the fish going out. In 1800 the pool was enlarged, and from that time it has always contained tame fish which feed freely from the hand.

June.—The most noteworthy plant in flower this month is *Echium Pininana* (fig. 10). Possibly it has never flowered in Scotland before. A native of the Canary Islands, the plant expects very different conditions from those it finds here ; nevertheless it has succeeded from seed kindly given by Major DORRIEN SMITH from the Scilly Isles. This *Echium* is a biennial, and should flower in its second year, but here it has taken three years. There are ten plants flowering ; the largest attains to a height of 16 feet. The flowers are of a soft lavender-blue, carried in quantity on a spike 7 feet long, broad at the base and tapering off to a point at the top, the whole spike being out at once and lasting in that condition for a couple of months. It is a very handsome plant, best grown in groups. One specimen in poor stony soil and exposed to all the winds is the best. It is curious that out of a batch of seedlings certain plants, perhaps one in twenty, will withstand with impunity the rigours of this climate. The seed gathered from the best of these may produce a hardier strain in course of time. Another, *Echium Bourgeanum*, is also flowering, but unfortunately it lost its top during the winter. This has narrow glaucous foliage ; the flower is neither pink nor red, but something between the two, a bright showy colour. The intensely scarlet flowers of *Embothrium coccineum* against a very dark background are wonderful. The plant is 20 feet high ; shade and moisture at the root are necessary to its



FIG. 5. MESEMBRYANTHEMUMS ON ROCK WALL.

[To face p. 8.

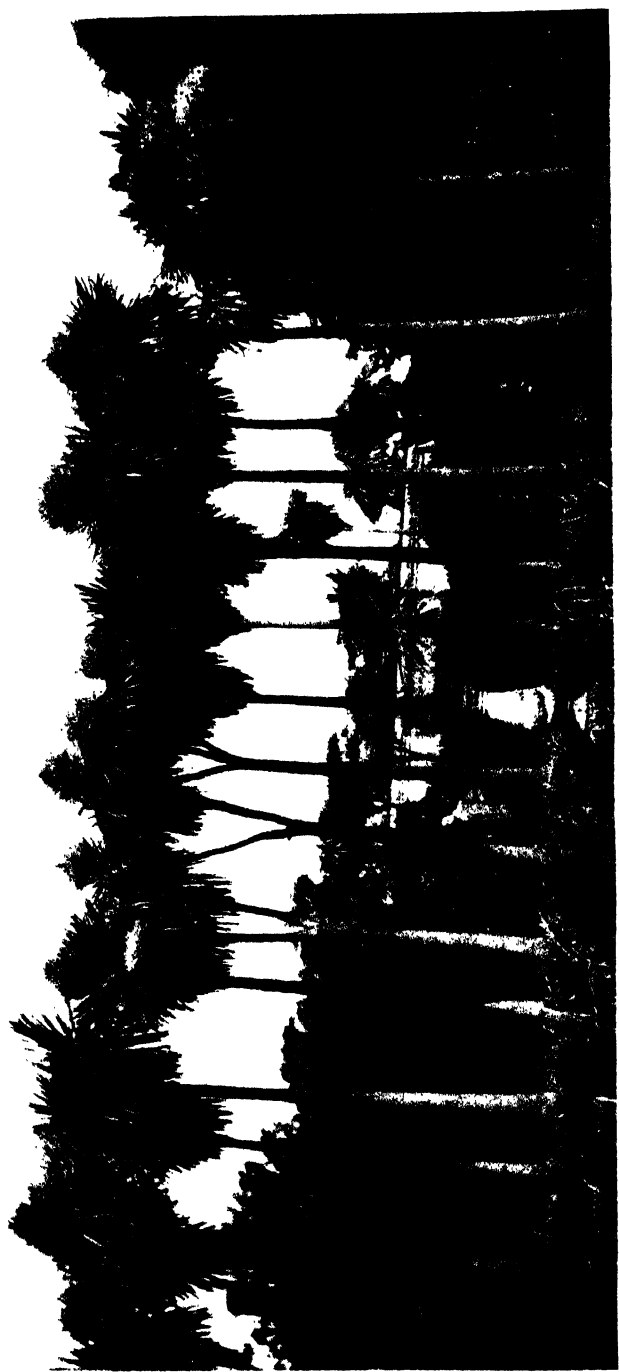


FIG. 9.—CORDYLINAE AUSTRALIS IN FLOWER.

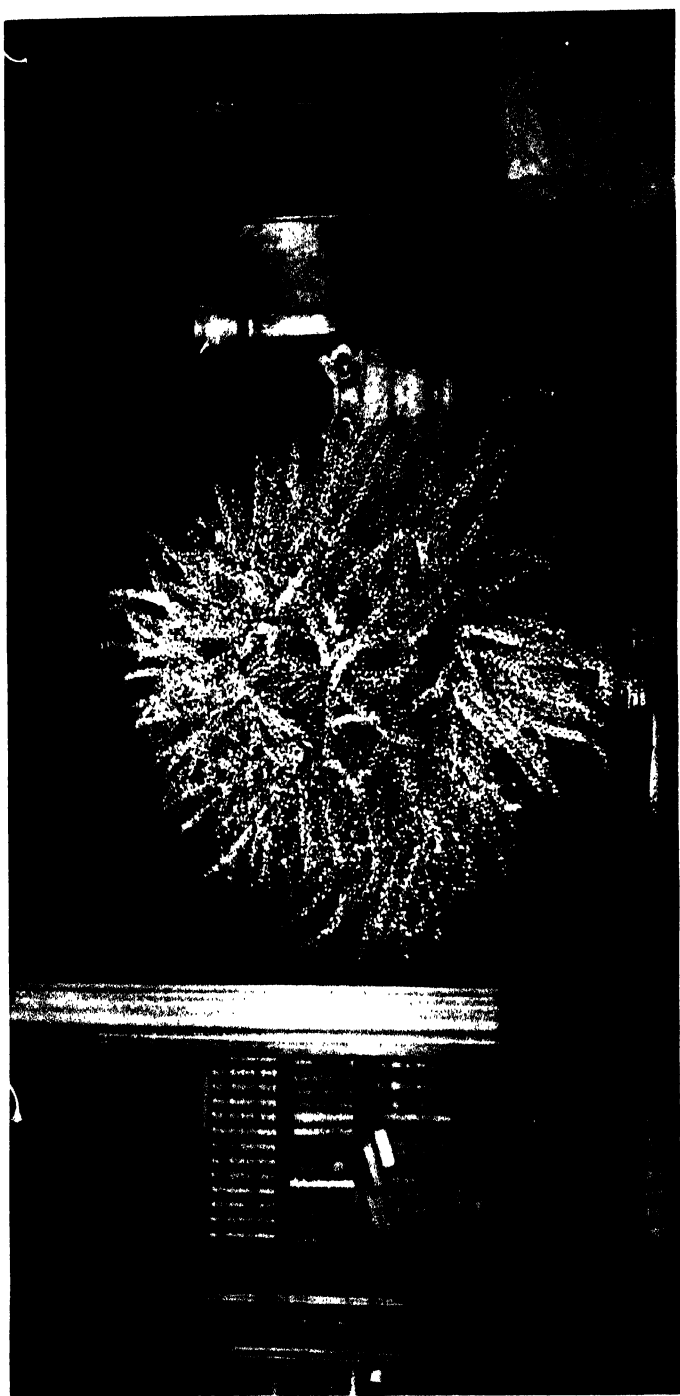


FIG. 7. THE FRUITS OF *CORDYLINE AUSTRALIS*.



FIG. 8.—CORDYLINE, EUCALYPTUS AND ECHINUM.

well-being, and so long as it gets plenty of sun above it never fails to show its brilliance each year. *Drimys Winteri*, 21 feet high, covered with clusters of ivory-white flowers well displayed against the dark green leaf, is one of the finest plants in the garden just now (figs. 11, 12); *Crinodendron Hookeri* growing beside it is ablaze with red lantern-shaped flowers, beloved of bees in search of pollen: this plant stands 17 feet and has a spread of 40 feet round, and looks as though in time it would grow into a tree. These three are from South America. *Buddleia Colvillei*, arching itself over a path, is rather a straggling plant, but the flowers are good and much larger individually than any of the others of this family. *Fuchsia Riccartonii* grows everywhere, and when it attains to a large size is a beautiful shrub; it is never cut down by frost here and grows 16 feet high, sowing itself all over the place, even to the extent of being a troublesome weed. *Tropaeolum speciosum*, like the Fuchsia, is another good thing that has to be kept in check, for it comes up everywhere and will quickly smother another plant; but such a fine creeper as this, with its large scarlet flowers, which are followed by turquoise berries, is left alone wherever possible. Many of the Fuchsias are draped with *Tropaeolum*, the two plants flowering at the same time. *Gunnera manicata* is useful for damp, shady places. The flower-spike is handsome, sometimes over 6 feet high, and should never be cut off as is recommended to enable the leaf to grow larger, for apparently it makes no difference to the ultimate size, 9 feet across. *Rosa Moyesii* as a single Rose is indispensable, so good is its habit and so beautiful the colour, forming quickly a large specimen; the red fruits hang long on the plant and are very ornamental. *Magnolia Watsoni* has this year produced many large fragrant flowers. *Abutilon vitifolium* requires renewing from time to time where it does not reproduce itself naturally; it is not a long-lived plant. The seed capsules contain quantities of minute sharp particles which, when released, fly about, and unless care is taken when gathering the seed they will almost suffocate the collector. A double row of the hardy Palm, *Chamaerops excelsa*, brought here many years ago from the South of France, are now large specimens; the round black seeds of last year still remain on the plants, while the clear yellow flowers of another summer bloom just above them.

Cestrum elegans, 13 feet high, tops the garden wall and is covered with crimson flowers; next it is the yellow form, also doing well, but not nearly so attractive. The herbaceous borders are good and will continue so till October. In this windy climate it is necessary to support the plants, and this is done by placing branches fairly thickly all over the border before the plants grow; the branches are soon hidden completely by the foliage, which grows naturally through them, and no further support is required. In the rock garden, *Libertia formosa* has sown itself in the crevices of the rock, and straggles out from the main planting, adding much to its beauty; it has the merit of lasting a long time in flower. In the peat terrace *Nomocharis pardanthina* is at its best. The two strongest bulbs have eleven and

ten flowers respectively, and are 3 feet high ; others have from two to six, measuring 4 inches across the petals. The colour is a soft pink relieved by dark spots sometimes all over the petals. Some of the *Meconopsis* are flowering among the dwarf *Rhododendrons* near by, but the latter are over with the exception of the orange-flowered *R. dichroanthum*. *Celmisia grandiflora* and other New Zealand Daisies are nice plants, pleasing at all times of the year. *Philesia buxifolia* flowers well here ; one large plant in the rock garden, growing in full sun, and with very little soil at the root, has a lot of flowers drooping over the rocks, where it seems very happy, in spite of the fact that shade is recommended for this South American shrublet, the flowers of which are so like a *Lapageria*. *Lilium hyacinthinum*, grown from seed collected by FARRER in China, has proved a valuable plant. The flower is very handsome and freely produced on a 4-foot spike in June ; soft mauve in colour, each petal is tipped with vivid green, which adds greatly to the beauty of the flower. After ripening fertile seed the old plant dies, but young bulblets are produced and they soon make flowering specimens if taken up and divided and replanted at once in good soil. The bulb likes to be almost on the surface (fig. 13).

July.—In the garden *Cordyline australis* is flowering with unusual profusion. There are 248 flower-spikes out just now, scenting the air with their sweet fragrance all day long, but especially in the evening hours ; outside the garden walls many more are displaying their wonderful blooms. *Hymenosporum flavum*, with clear yellow cistus-like flowers, is a nice little shrub. *Callistemon salignus*, 12 feet high, is covered with quantities of yellow bloom (fig. 14). This plant came here many years ago as a tiny seedling from the R.H.S., and was planted out at once ; it has never received any check since. *C. floribundus*, with bright-red bottle-brush flowers, growing as a standard, is also doing well and flowering freely. *C. Wilsonii* has a few mauve blooms for the first time. Several other varieties grown from seed are coming on outside. A *Buddleia* more curious, perhaps, than beautiful, of strong growth from China, Farrer No. 1238, has a thick raceme 12 inches long of ivory-white flowers enlivened with a bright orange centre to each ; this is, so far, an unnamed species. *Desfontainea spinosa* is covered with tubular flowers of bright red with a yellow throat, hanging freely all over the large plants, and will continue till October. The fruit of this Chilean plant is just the shape and colour of a minute lemon.* *Calceolaria integrifolia* is a very fine shrub as it grows here, but it is not hardy in most places. Two plants in a thriving group of *Lilium Grayi* have grown 6 feet 6 inches, bearing twenty-six flowers each, of dark-red colour, heavily spotted with black inside the petals. This is a magnificent species from California. Another tall-growing Lily is *L. Burbankii*, which has reached 7 feet 6 inches. Others in bloom are *Brownii*, *croceum*, *Duchartrei*, *giganteum*, *Hansonii*, *Humboldtii magnificum*, *Farreri*, *Krameri*, *regale*, *Wilmottiae*, all established bulbs ; and *Lilium Martagon dalmaticum*. The last, owing to its unique dark claret-colour and strong growth, is one of the most

beautiful of all the Lilies. Many *Cremanthodium*, Farrer 1179, whose heads of long-rayed ragged flowers of citron-yellow hang and never look up, have been planted in the grass and are doing very well.

Lobelia Tupa, from America, is a fine plant growing over 6 feet high; it was from the roots of this handsome plant the American Indians extracted a poison for their arrows.

This has been a good season for Roses; all varieties have produced large blooms in quantity. Delphiniums, too, have been very fine, growing 9 feet. *Fuchsia ceratifolia* has a bright pink tube $1\frac{1}{2}$ inches long; the outer petals are green, the inner ones bright orange, giving the flower a wonderful combination of colour; this fine species is blooming freely in a sheltered place against a south wall. The old Portugal laurels in the garden are always pleasing this month for a short time while the inflorescence lasts. *Hydrangea hortensis*, the flowers of which vary so much in colour, as is well known, is grown here in quantity; in the garden the flowers are pink, in the woodland and other places always a shade of blue, owing presumably to iron in the soil. A few years ago some cuttings were procured from a plant of *H. hortensis*, in which the colour seemed much more pronounced than in those usually seen; this plant had very deep pink flowers of unusual intensity, and it seemed possible that the deep colour in this particular plant would hold and become blue in the natural soil here; this has proved to be so, the exact shade of the flowers compared to a plate in the French Colour Chart *Répertoire de Coloueurs, pour aider à la détermination des Colours des Fleurs*, is found on p. 212, plates 1 and 2, described as Bleu d'Outremer—'Cornflower blue.' This rather points to the fact that to get a true blue colour in this plant without any artificial feeding, two things are required: first, a plant that naturally produces a deeply toned flower, no matter what its shade may originally have been; secondly, iron in the natural soil. Seemingly, if a plant of *H. hortensis* gives flowers of a pale shade, it will never develop under any natural conditions, however favourable, flowers of Cornflower blue. The Olearias for beauty of form and profusion of blooms are unsurpassed. *O. semidentata*, *O. chathamica*, and *O. Colensoi* have become sturdy plants in rather poor stony soil in an open situation. Here the two former flower freely, rivalling each other; both have large pale-purple flowers on long stalks; self-sown seedlings have appeared around them. Other kinds are grown. *O. Haastii* makes a good hedge, smothered with bloom at this season. Near by, *Dierama pulcherrimum* waves its flowery wands on the thinnest of 6-feet stalks, but these never break in the strongest winds; it does best in well-drained stony ground. *Solanum crispum* is a rampant and quick-growing climber, though well worth growing when in the right place, where it can ramble over an old tree and produce its large bunches of bluish-purple flowers high up among the branches. *S. jasminoides*, a much more refined species, with white flowers, is always beautiful wherever it may be. Tigridias grow here as in their native Mexico, 3 feet tall. One round group about 8 feet across, of the red *T. pavonia speciosa*, often has nearly two hundred

flowers open together on a fine morning, lasting until one or two o'clock, when they fade, but the next day the show is as good as ever. Thousands of seedlings have come up around them and will commence to flower in their second year. The carmine and the white-flowered forms are equally effective; all have strong bright-green healthy foliage; they are never lifted. To succeed with this Irid it is necessary to grow the bulb from seed and plant not in a dry but in a moist soil, in a position fully exposed to the sun. In Mexico this plant grows naturally in fruit orchards, in open places among the trees where the shade is not dense and where the ground is irrigated. The closely allied *Cyphella Herbertii*, a free-flowering bulb, with chrome-yellow blooms, and *C. plumbea* grey-blue, are growing near the Tigridias among the stone chips in the garden. Another bulbous plant now out is *Lycoris squamigera*; the leaves of this have died away, leaving the strong flower-stems bare, topped with from four to six large blooms, flesh-pink with a blue tinge. *Cyananthus* species, Farrer 1220, is a lovely little Alpine both on account of its foliage and for the deep-blue flowers, not unlike those of a Gentian. Contrary to the usual behaviour in our gardens of the inhabitants of the very highest altitudes in China, this *Cyananthus* has thriven in the peat terrace for some years.

August.—A few of the best annuals are used to brighten the garden in the late summer, grown always in quantity of a kind together wherever space allows. They must, of course, be well thinned if they are to fulfil their purpose. Sweet Peas are never forgotten, and climb over the tops of young larches, which are cut for the purpose and inserted in the ground wherever a special colour is required. *Yucca gloriosa* is 11 feet to the top of its flower-spike. *Myrtus luma*, so dark in leaf, grows tall and blooms freely. The sweet-scented verbenas, *Lippia citriodora*, at this time of year is veiled with small lilac flowers. Veronicas of many kinds have grown into large plants, and always make a good show in the late summer and autumn. *Romneya Coulteri*, standing by the water-lily tank, does not die down in the winter, and so forms a shrub 8 feet tall. It is a beautiful plant, the large white poppy-like flowers scented just like a primrose. *Ceratostigma Willmottiana*, a shrub of much merit owing to the bright-blue flowers opening late in the summer, should be much more grown than it is. *Hydrangea villosa* is a beautiful tall-growing Chinese plant, standing 11 feet, introduced by WILSON. The big, rather soft, dull-green leaf combines well with the large flower-heads; the outer sterile flowers are pink or white and the fertile ones in the centre a shade of very bright violet-blue. There is a large group of this very fine species in the garden. There are two large plants of *Fuchsia excorticata*, 15 feet, growing together, from New Zealand; the flowers are of queer dull colouring, but are interesting on account of their cobalt-blue pollen.

The yellow-flowered form of *Datura sanguinea* has for many years occupied a space at the foot of the old castle wall; it is 8 feet high by 15 feet. Here it flowers regularly; the solitary pendulous 7-inch long trumpets will continue to open from now on till November or



FIG. 9.—RHODODENDRON OREOTREPHES.

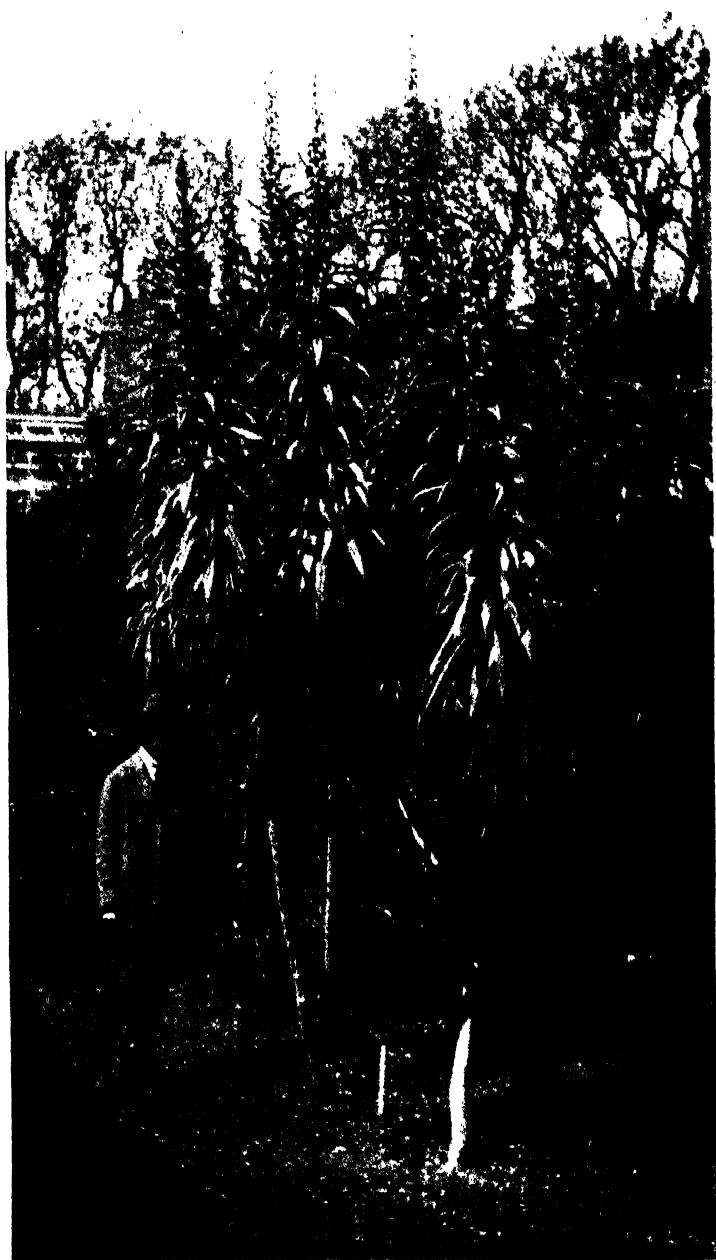


FIG. 10.—*ECHIAM PININANA*.



FIG. 11.—DRIMYS WINTER.

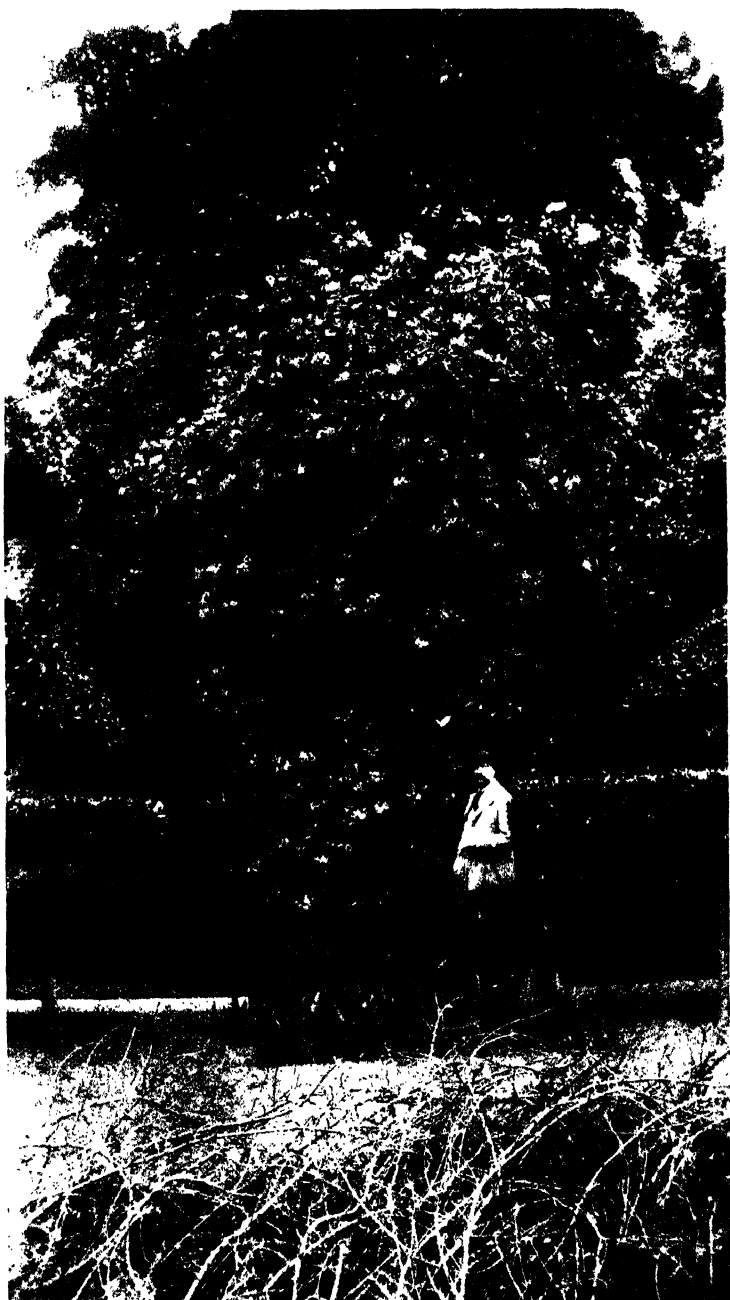


FIG. 12.—DRIMYS WINTERI.

[To face p. 13

even December. Though this plant comes from Peru, it is able to withstand a certain amount of cold, and it does not object to cloudy skies.

Lilium nepalense var. *ochraceum* was raised from seed sown outside, and now fills a border of itself. The fifty plants have grown 6 feet high and are flowering freely; the greenish-yellow blooms hang on long stalks and have a wide dark-maroon centre. This is a beautiful Chinese species. *Lobelia Deckoni*, from an altitude of 10,000 feet on the mountain of Ruwenzori in Central Africa, promises to be a success. The plants have withstood several winters without damage and are growing strongly, having reached a height of 2 feet 8 inches, but it may be some years yet before the flower-spike makes an appearance, and there seems no reason why this giant *Lobelia* should not produce its wonderful flower-spike 5 feet to 6 feet in length, broad at the base, and tapering very slightly to a round top. The actual flower is of true *Lobelia* form, a very dark blue, almost black, each one shielded by a light-green bract. The leaf is somewhat like a *Yucca*; the young growth in the centre is always covered with an inch of water held in a sort of cup made by the leaves, and this never dries up under any weather conditions.

During *September* and *October* there are still many good things flowering in the garden. Among them the herbaceous *Lobelias* for their brilliance of colour are especially fine, growing in the borders and in the grass. 'Huntsman' is outstanding; the brilliant scarlet flower spike is strong and massive, growing 5 feet. *Lilium auratum* has been established in the woodland for four years and has reached a height of 9 feet; it flowers magnificently each season. *L. tigrinum*, also in the wood, has formed a nice clump and is 8 feet 9 inches high, beautiful when in flower. *L. philippinense formosanum*, grown from seed, is late to open its fine white trumpets; the bulbs were put out when quite small and planted near the surface. Here at any rate they are perennial, reaching nearly 5 feet in height. A good rambling plant, covering some old apple trees, is *Senecio scandens*; the large bunches of loosely displayed yellow star-like flowers hang out from the foliage when grown this way, and continue to bloom until November. *Lonicera tragophylla*, a good honeysuckle with large yellow flowers but quite scentless, is grown in the same way. *Cobaea scandens*, so rampant but good on a wall, seems to overflow itself, perishing usually after its second or third year; it is now being tried up a tree where if it succeeds the life of the plant may be a longer one. *Tritomas* are planted in large groups on the lawn near the house, and during *September* and *October* the vivid hues of their red and yellow flowers blend with the autumnal colouring of the landscape. Some of the modern forms of the Pampas-grass are planted near them. These have strong stalks and never blow down in the heaviest winds, a great improvement on the original species, which could not stand up against the winter storms. *Eupatorium Weinmanniana* is a nice shrub in *October* when covered with white flowers so thickly as almost to hide the foliage. The plant is never pruned, but allowed to grow

naturally, and it never fails. Three young plants of *Rhodoleia Championii* from China are doing well. *Amicia Zygomeris*, an uncommon 9-foot herbaceous plant, when fully developed in October has curiously cut leaves which droop in the evening light; the large purple-veined bracts and yellow pea-shaped flowers give the plant an interesting aspect. A sedge from China, *Carex baccans*, forming a dense tussock of narrow leaves 6 feet in length, arching gracefully outwards and with panicles thickly set with small red berries in October, standing well above the leaves, is in its way a handsome plant. *Nerine Bowdeni* is hard to beat when planted at the foot of a south wall. In such a position the large clear pink flowers open in September and October, continuing to bloom for many weeks and are useful for cutting, for they last well in water.

Gentiana sino-ornata, so amenable and so beautiful in autumn, will succeed almost anywhere, but let the flowers have the sunshine on them. *G. Farreri*, though not so strong a grower, is worth every care. Seventeen young plants of *Juniperus* sp. F. 1407 are strong and of rapid growth. FARRER in his field notes, 1919, says of this Juniper: "I have hopes that this may prove the most important economic introduction for many years past, for it is, presumably, hardy, superior at all points to *J. virginiana*, which it ought to drive quite off the market for 'cedar' oil, 'cedar' cabinets, and 'cedar' pencils. It is, besides, a remarkably lovely, graceful, weeping, grey-green 'Cypresa' of 80-100 feet, occurring rarely in the ravines of woodland of the upper Chimili, never under 10,000 feet, in a region where the summer is wet and sunless, the winters of alpine cold, and the springs late and ungenial and chilly. Its chief distribution is said to be farther north, yet always on the non-Chinese side of the borders, whence incessant strings of coolies, each loaded with a single plank 7 feet long, carry it over the wildest passes far into China, where it is inestimably prized for coffin-boards, so that £50 to £60 are no uncommon price for a single plank. The wood is close and fine in grain, immortal, and of the most delicious fragrance, either fresh or burned strips. Under good cultivation it should yield a return, if only in oil, in thirty to forty years; it may object to limestone soils, but, I imagine, will be a safe thriver in woodland compost anywhere. Altogether, in every way, a very rich prize indeed."

When October ends, attention is again turned to the many thousands of young Chinese Rhododendrons which occupy positions in circular beds prepared for them in different parts of the woodland in which they spend their earlier years until large enough to be moved into permanent positions. Some species develop very much quicker than others. The leaves on one plant of *R. sino-grande* measure 33 inches long by 11 inches across; on several others the leaf is 30 inches. The garden year is brought to an end at Christmas, when a large bunch of roses is almost always gathered for the house.

The Garden of Logan, near Port Logan, is open to the public on Wednesday afternoons during the summer months.

BOTANICAL EXPLORATIONS IN TIBET.—I.

By Capt. F. KINGDON WARD.

I HAD long wished to explore the unknown country round the knee-bend of the Brahmaputra, or Tsangpo, where that river forces a passage for itself from the Tibetan plateau through the Himalaya to the plains of India. Much was known of the flora of Sikkim and Bhutan on the one hand, and of Western China on the other; but of the intervening region, from the 90th to the 98th meridian of east longitude, between the parallels of 28° and 32° , practically nothing was known.

After several years devoted to botanical exploration in Western China, Upper Burma, and the adjacent Tibetan borderlands, therefore, the climax to my ambition was reached when in 1923 Lord CAWDOR and I obtained a permit to travel through Tibet to the great gorge of the Tsangpo, with the result that we spent nearly a year in 1924-5 exploring and botanizing in the least-known parts of the country. In order to make our objective clear, I will briefly describe our route, both going and coming. Secondly, I will refer, equally briefly, to the floral regions which meet at this point, and to the peculiar botanical interest of these colliding mountain ranges; and lastly, I will speak more fully of the actual plants met with.

We left Darjeeling in March 1924, following the caravan route to Lhasa, which passes through Gangtok, the capital of Sikkim, and so via the Nathu La (14,500 feet) into the Chumbi valley. At Chumbi we were in Tibetan territory, though still south of the Himalaya, and it was not till we reached Phari, and crossed the Tang La (15,500 feet) that we found ourselves on the great plateau. Seven more marches brought us to Gyantse, a part of the country which is now fairly well known, having been botanically explored by a number of people in recent years, particularly by Mr. G. H. CAVE of Darjeeling.

Leaving Gyantse in April, we crossed the Trans-Himalayan range by the Karo La (16,000 feet) and descended to the south-west corner of the Yandrok lake. Here we left the Lhasa road, turned due east, skirting the southern shores of the lake, and, crossing yet another lofty range, descended to Tsetang on the left bank of the Tsangpo, fifty miles due south-east of Lhasa.

From this point we followed the Tsangpo eastwards 200 miles to the head of the great gorge, and made our base at a small village called Tumbatse, two days' journey north of the Tsangpo. The approximate position of Tumbatse is $94^{\circ} 45' \text{ E. } 29^{\circ} 45' \text{ N.}$, so that we were now fairly inside the unknown region.

Throughout the summer of 1924 we botanized on both sides of the Tsangpo, paying several visits to the eastern Himalaya south of the

river, and even crossing the main Himalayan range. We also crossed the Tsangpo-Salween divide to the north, reaching 30° 30'.

In the winter we traversed the gorge of the Tsangpo and retraced our steps to Gyamda, on the Lhasa-China road, whence we marched westwards to within a few days' journey of Lhasa again, and, turning due south to the Tsangpo, reached Tsetang for the second time on January 31, 1925.

From Tsetang we followed a route almost due south, keeping close to the 92nd meridian; and recrossing both the Trans-Himalayan and Himalayan ranges within ten days, we soon found ourselves in Eastern Bhutan, whence the plains of Assam were reached towards the end of February.

Thus, though we actually marched over a thousand miles in Tibet, our plant collection was made almost entirely in the valley of the Tsangpo and its tributaries, never far from the main river; almost the only exception being a small collection made on the Tsangpo-Salween divide, and the plateau to the north.

In order to understand the peculiar relationships of this Tibetan flora, it will be necessary to say a few words about the surrounding regions,

Westwards, the Central Asian flora (of which the Tibetan flora is a part) abuts on the oriental flora of Afghanistan and the Punjab. To the south is the tropical Indo-Malayan flora, which includes the flora of Peninsular India and Burma; while to the east is the very rich Eastern Asiatic flora of China.

These floral regions are all linked together by ramifying ranges of mountains, the Himalayan and Trans-Himalayan ranges forming one system from east to west, the Burma-Yunnan ranges another from north to south. These two very distinct mountain systems collide in Eastern Tibet, where we find three distinct floras meeting.

Besides acting as carriers, mountain ranges also act as barriers, and in addition possess a flora of their own. We must therefore recognize, in addition to the above, a fourth flora, which may be called the Sino-Himalayan, partly Himalayan, partly Chinese, partly Central Asian, and partly indigenous; and it is this mixed mountain flora that I shall chiefly describe.

At Darjeeling we had an opportunity of seeing something of the Sikkim flora in the Lloyd Botanic Garden. Though small, the garden is well laid out, and boasts some magnificent trees of *Magnolia Campbellii*, both the pink- and the white-flowered variety. The former seems to be very rare and local, for though we saw scores of trees in the forests above Gangtok, they were all white-flowered. *Picea Morinda*, the beautiful weeping fir of the Eastern Himalaya, also does well in Darjeeling. Other trees are: *Acer villosum*, and *Pinus longifolia*, the latter a mist of white blossom; while amongst a variety of Rhododendrons, *R. grande* and *R. ciliatum* alone were in flower. It is interesting to note that *Primula malacoides*, introduced a few years ago, seeds itself freely on walls.

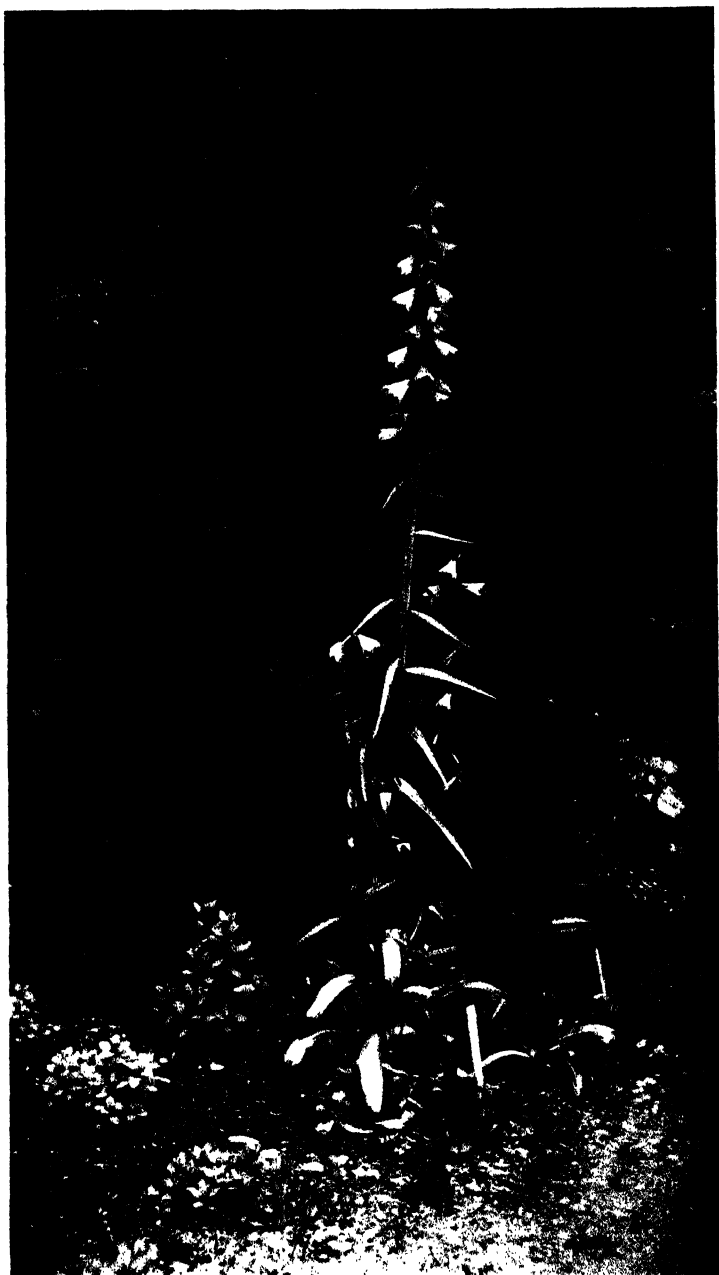


FIG. 13.—*LILIUM HYACINTHINUM*.

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FIG. 14.—*CALLISTEMON SALIGNUS*.



FIG. 15.—CELMISIA LANDSAYI.



FIG. 16.—LOBELIA DECKENII.

Leaving Darjeeling on March 14, we descended through green forests of oak, Magnolia, Michelia, etc., blotched with the scarlet of *Rhododendron arboreum*, through the tea-gardens, to the scorched monsoon forest above the Tista river; and two days later we began the long climb up the Tista valley into the real Sikkim jungle. In the dry weather, the chief feature of the half-leafless monsoon forest is the number and variety of Acanthaceae in bloom. They form most of the undergrowth, some with flowers of bright cobalt-blue, others orange, or brick-red, or white. Prominent amongst them are species of *Strobilanthes*; a species of *Clerodendron* with white flowers was also seen, but there was little else in bloom here. Much of the leafless jungle was Sâl forest (*Shorea robusta*).

Ascending the Tista valley, famous as the scene of HOOKER'S explorations eighty years ago, we found *Bauhinia variegata*, leafless but in full bloom, forming lilac smudges on the hillside, and in a village noted pumilo bushes (*Citrus*) with sweetly, almost sickly, scented waxy white flowers, like orange-blossom. As we ascended out of the heat and dust of the plains into the foothills of the Himalaya, the forest became much greener, till by the time we reached Gangtok, the capital of Sikkim, at 5000 feet, we were practically in the temperate rain-forest, which is largely evergreen. Here the trunks of the big trees are much more fluid than down below, and quickly break up into a network of branches, covered with moss and festooned with epiphytic orchids, *Lycopodium*, *Ericaceae* (*Agapetes*), and *Gesneraceae*, besides ferns in great variety. Amongst the trees are noticed *Schima*, by reason of its reddened leaves now dropping, *Bucklandia* and *Pterospermum*, conspicuous for their foliage, *Englehardtia*, with fat tails of dry fruits hanging from the twigs, *Ficus elastica*, and several oaks, many of them decorated with massive clumps of the pretty white and yellow orchid, *Coelogyne cristata*.

In the fine Residency garden, where we stayed two days with the Political Officer, we saw many Sikkim orchids in flower, including *Dendrobium heterocarpum*, *Cymbidium grandiflorum*, *Saccolabium calceolare*, species of *Eria*, and others. We saw also a beautiful dwarf larkspur, forming sheets of blue, which had been collected in Bhutan. While the Political Officer specializes in Himalayan plants, the Maharaja goes in for English ones, and in the well-kept garden of His Highness' palace we saw herbaceous borders of Brompton Stock, Petunias, scarlet Geraniums, and Sunflowers, with beds of Roses in the centre of a very English-looking lawn, complete with tennis-court. The roses have to be protected from the hail with bamboo matting. Against the wall was a magnificent *Wistaria*.

Above Gangtok we soon came into forests of *Rhododendron*, which appeared in the following order: *arboreum*, *Falconeri*, *grande*, *barbatum*, *Thomsoni*; only the first named was in bloom.

March, of course, is much too early for flowers in the upper Sikkim forests, but there are just two things which are well worth seeing—the drifts of mauve *Primula petiolaris* and its varieties beneath the bamboos,

and the ivory cups of *Magnolia Campbellii* floating all up the terrifically steep spurs which buttress the snow-peaks behind.

In the alpine region it was still the depth of winter, and all one saw sticking up though the snow were the skeletons of such tall plants as *Meconopsis paniculata* and *M. simplicifolia*; but after crossing the Nathu La we found *Primula denticulata* sunning its mauve mops on the steep turf-slopes of the Chumbi valley.

That was the last caress of spring for a month, our road now climbing directly to the Tibetan plateau, which was reached via the Tang La, 15,500 feet. At squalid Phari, the route to Mount Everest diverged from ours, we continuing northwards by the Lhasa road to Gyantse, while the climbers turned westwards. We had to cross 200 miles of plateau at an average elevation of 14,000 feet in order to reach Tsetang, on the Tsangpo, and how dreary that was, even in April, may easily be imagined. Not only were there almost no flowers at all, there was little enough sign that there ever had been or ever would be any; for the plateau during the long, windy winter is a frozen desert. True, the tiny rose-flowered *Primula pygmaeorum*, one of the smallest of its kind, was flowering on the brown, grassy hummocks, and when at last we reached the great river there were clumps of pale *Iris nepalensis*, but nothing else. Nevertheless, this part of the plateau, south of the Tsangpo, boasts quite a considerable flora, over 200 species of flowering plants occurring round Gyantse (13,500 feet), while in the rocky glens, sheltered from the blast, are a number of small under-shrubs such as *Sophora viciifolia*, *Rosa sericea*, *Potentilla fruticosa*, *Lonicera spinosa*, Caragana, etc. Even small trees, such as willows, poplars, and Hippophae, grow by the streams and irrigation channels.

But Gyantse is rather an oasis in the wilderness, and round the Yamdrok lake one soon comes into barren country again, where patches of dwarf Juniper clothe the hills. There is much salt in the soil hereabouts. *Meconopsis horridula* grows up on the barren scree, and *Primula Waltonii* by the ditches; but there was no sign of these yet.

As we descended the valley which led down to the Tsangpo, we found ourselves in a regular Garden of Eden, compared with the barren plateau; but its fertility depended entirely on a permanent flow of water in the stream. Poplars, elms (*Ulmus pumila*), thickets of Hippophae, and, round the houses, Peach and Crab trees in full bloom, made a very welcome appearance. The polished red and yellow twigs of willows, and hedges of fragrant Buddleia—a species with small buff flowers—and a variety of plants on the cliffs—Ephedra, Berberis, Ceratostigma, Polygonium, Androsace, *Campanula colorata*—made the valley appear almost well vegetated; and besides this there was a good deal of cultivation, and the banks of the stream were covered with green grass. A few miles farther down, the water disappeared underground, and almost every vestige of plant life disappeared with it, till we reached Tsetang.

Tsetang stands at an altitude of 11,800 feet above sea-level, on the right bank of the Tsangpo, which is here flowing in a wide trough of

the plateau ; it is just fifty miles south-east of Lhasa, and three days' journey from the holy city.

The valley is very arid, very little rain or snow falling in the six winter months, and the fiercest daily winds blow, raising sand and dust storms which are sometimes almost unbearable. Though there are a few trees round the villages, the valley is on the whole very barren, with huge sand-dunes and gravel-banks, covered with a scanty covering of thorn scrub ; but as we travelled eastwards the vegetation grew gradually richer and more varied, till, finally, we found ourselves in the midst of a wonderful flora.

Leaving Tsetang on April 23, we followed the Tsangpo eastwards for some 200 miles to Tsela Dzong, where we arrived on May 11. The dryness of the trough, marked by an almost complete absence of trees, except in the villages, gradually gave place to a more temperate climate. At first such trees as could stand the cold drought kept well up the flanks of the hills out of the draught ; but as we travelled eastwards they crept down lower and lower, till by the time the entrance to the gorge is reached the cliffs are thickly forested right down to the water's edge.

But even where the valley itself is almost a desert there are plenty of flowers high up on the flanks of the hills, and in the glens ; nor was it long before we began to find some variety even down by the river, a bright yellow-flowered Caragana, for instance, which grew on the sand dunes, looking from a distance exactly like gorse. The first big trees met with by the river were Junipers, and then came a species of Pinus ; by this time forests of Picea and Larix had appeared higher up, with a dense growth of bamboo, the whole draped with lichen, which is a sure sign of a prolonged dry season. Meanwhile, on the lower flanks of the hills, one saw in fruit species of Morina (like *M. Wallichiana*), Androsace (like a huge *A. spinulifera*), Incarvillea (perhaps *I. lutea*), *Codonopsis convolvulacea*, Delphinium, Verbascum, Pedicularis, and other plants ; and in flower, or nearly so, *Rosa sericea*, *Sophora viciifolia* (a form with dark violet flowers), *Clematis montana*, *Primula atropapilla* (by irrigation channels), a species of Arisaema with a dull yellow spathe, *Podophyllum Emodi*, a golden-flowered Barberry, and a Cotoneaster.

Rhododendrons were met with in the following order. First, two dwarf alpine species, a Lapponicum and an Anthopogon, neither of them in flower ; then a purple-flowered dwarf Lapponicum from right down by the river, and a beautiful Triflorum with variable flowers from mahogany-brown to salmon-pink, or sometimes sulphur ; while in the woods above a pink speckled Taliense was abundant.

Crossing a high pass, one found that even as far west as this there was a considerable alpine flora, and in the snow I noticed the relics of two species of Meconopsis, species of Primula, etc., and lower down were drifts of the mauve-flowered *P. atropapilla* (which closely resembles *P. denticulata*), and rose-coloured patches of the tiny *P. pygmaeorum*, one of the Auriculata section.

After the first appearance of scrub evergreen oak, and of *Buxus sempervirens*, in the valley, the flanks of the hills became well clothed with vegetation, and where permanent streams flowed it was almost luxuriant. On the other hand, after a certain point, the farther we travelled eastwards, the less advanced was the spring, though we were now into May, and 1500 feet below Tsetang; the reason for this delayed spring is probably the immense accumulation of snow at the eastern end of the Himalaya, where the river begins to cut its way through the range.

Amongst the thickets we now found species of *Piptanthus*, *Ribes*, *Euonymus*, *Rubus*, *Tamarix*, *Buddleia*, *Spiraea*, *Smilax*, *Betula*, and *Loniceria* (like the Chinese *L. Myrtillos*), several of them, including the *Piptanthus*, in flower.

That we were approaching a region of forest where there grew some very big trees was evident; for we saw in several villages prayer-flag poles which must have been 200 feet high, and at the various ferries dug-out canoes were in use, their dimensions being: length, 35-40 feet; depth, 2 feet; diameter, 30 feet. At Tsela Dzong, where the wide Gyamda river joins the Tsangpo, we were on the outskirts of the forest region, and it will be convenient to deal with the flora in two parts, namely (i) that of the region of dry winters and wet summers, and (ii) that of the region of constant precipitation. As regards the latter, the winter precipitation may be snow, as in the alpine region, or rain, as in the temperate rain-forest and sub-tropical forest. In order to understand the relations of these two floras, it will be necessary to say a few words about the country.

So far we had met with only the plateau flora, which is a semi-desert flora with Central Asian affinities; there is also a certain Himalayan element in it.

We were now in a region of abundant summer rainfall. Here the south-west monsoon squeezes its way up the river gorges, which may be likened to corridors cut through the barrier range, and the mountain ranges which lie directly in its path and close to the gorge are drenched summer and winter—there is no dry season. The effect of the monsoon, however, soon weakens, even in summer, and the mountain ranges lying farther back are successively drier, though even the driest get some rain in the summer. It is only in winter that they suffer prolonged drought. I shall therefore deal first of all with this forest region of dry winters, noting that the forest is chiefly of the evergreen Coniferous-Rhododendron type, with a few broad-leaved trees and numerous shrubs forming a woody undergrowth. Alpine meadow occupies the upper, anciently glaciated valleys, where the streams are lined with shrubs and small trees; and above the forest is the Rhododendron moorland, covered chiefly with dwarf Rhododendron of the Lapponicum and Anthopogon type, but with many alpine flowers also.

The upper forest is composed almost entirely of *Picea*, with occasional larch and *Tsuga*, though the latter never ripens any cones



FIG. 17.—CART-ROAD IN THE TISTA VALLEY, SIKKIM.



FIG. 18.—THE TIBET PLATEAU. A MONASTERY.



FIG. 19.—CART-ROAD IN SIKKIM. INDO-MALAYAN FOREST AT 1000 FT.

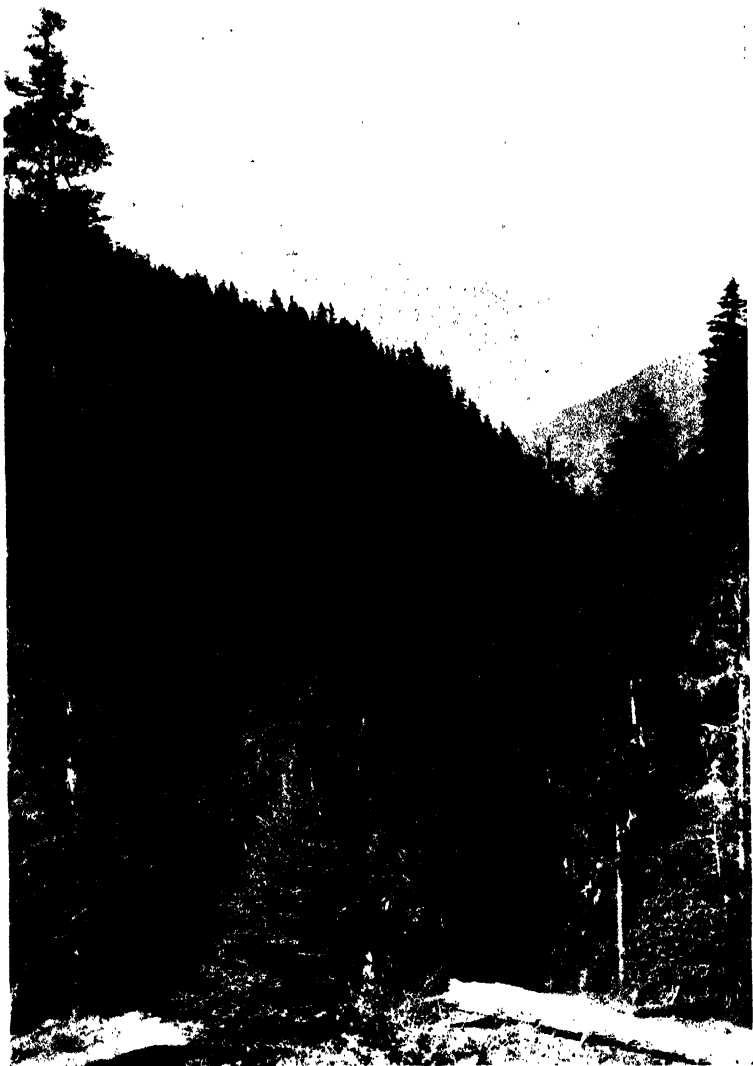


FIG. 20.--CONIFER FOREST AT 11,000-13,000 FT.
Himalaya in the background.

here, and finally *Abies*. The *Rhododendrons* are : a beautiful pink-flowered *Barbatum*, a pink-flowered *Thomsonii* and the *Taliense*, all opening in May ; a big-leaved *Lactum*, a small *Grande*, and a fine yellow-flowered *Souliei*, similar to *R. Wardii*, flowering in June ; and one or two other small species, including a *Roxieanum*. Other small broad-leaved trees include species of *Betula*, *Populus* (*P. alba* and another), *Salix*, *Maple*, *Pyrus*, *Prunus* (wild cherry, flowering as late as June), and *Oak*.

In the undergrowth are a variety of shrubs, such as *Rhododendron*, *Lonicera*, *Rosa* *Berberis*, etc. The *Rhododendrons* are : the *Triflorum* already referred to, a pink-flowered *Anthopogon*, and a lovely *Oreotrephes* with rosy purple flowers (K.W. 5790).

Amongst numerous species of *Lonicera*, the following are worth noting as showing the general relationship of this flora to that of the Himalaya on the one hand and to that of western China on the other ; several of them look promising as horticultural plants :—

K.W. 5645, 5715. This species is very similar to the Chinese *L. Myrtillus*, or the Sikkim *L. parvifolia*. The flowers are cream, narrow, tubular, pendent ; the twin fruits fuse, and are scarlet, translucent, on long slender pedicels. K.W. 5688. Closely allied to the Chinese *L. setifera*, if not actually that species, K.W. 5753. Probably the same as the Chinese *L. lilangensis*, or near, and of little garden merit. K.W. 5918. A pretty undershrub species with large yellow trumpet-shaped flowers and blue-black berries, like sloes, recalling the Chinese *L. cyanocarpa*. K.W. 5822 is the Himalayan *L. Webbiana*, a small forest-tree with inconspicuous maroon flowers, but fine foliage and large dangling red fruits like wild cherries. Closely allied species are the Chinese *L. adenophora* and *L. Fargesii*, and the Himalayan *L. alpigena*. K.W. 5776 and K.W. 5988 are of the *Cyanocarpa* type, having the same large persistent papery bracts forming a skirt round the tube of the yellow trumpet-flower ; but in both these the fruits are orange-scarlet instead of blue-black. K.W. 5766 forms a stout bush of tidy habit, and is in fact identical with the Chinese *L. hispida*. K.W. 5988 is, on the other hand, a prostrate scree plant ; both of them are very free flowering, and in full bloom are a charming sight, but they seeded abominably. K.W. 5872 is perhaps the most striking species of the lot, and is quite distinctly new. It has flowers of the *hispida* type, but deep plum-purple in colour ; the violet stems and glaucous leaves are glabrous, and the large blue-black fruits recall those of *L. cyanocarpa*. It forms a tangled shrub or bush, flowering in June and ripening its fruit in October.

Three species of *Rose* grow in the dry forest region, namely *R. sericea*, on open rocky hillsides, a white-flowered Briar, with smooth reddish-yellow fruits, and a red-flowered species with bristly flask-shaped scarlet hips like those of *R. Moyesii*—though the flowers themselves are a much more rosy-red than in that species. This plant was quite as common in the wet regions, sometimes growing 10 or 12 feet high and as much through, if it could find support. A much bigger climber,

which raised itself 30 or 40 feet up the trees, was also seen in fruit in the wetter regions (K.W. 6309).

On the alpine moorland grew a number of interesting dwarf Rhododendrons, forming a continuous carpet scarcely a foot deep. These are mostly of the Lapponicum type, and include perhaps two or three purple-flowered species, somewhat similar to *R. scintillans*. But there are also two other beautiful little plants, an aromatic-leaved Saluenense with flowers of crushed strawberry in heads of four (K.W. 5734), and a snow-white Anthopogon with a dark chocolate-coloured indumentum on the under surface of the olive-green leaves (K.W. 5733). Mixed up with these are two or three species of Lonicera, Berberis, Salix, Cotoneaster, Cassiope, *Diplarche multiflora*, etc., but no great variety of shrubs; there is nothing like the same variety of alpine shrubs in the dry zone as there is in the wet, but, on the other hand, there is a much greater variety of alpine herbs. To these I shall refer presently.

In the sub-alpine region where the Abies-Rhododendron forest thins out, a small bush Lacteam Rhododendron forms a dense scrub by itself; the flowers are all colours—pink, purple, white, and even yellow, more or less speckled. A rather lanky Anthopogon is also found there, growing on poor stony soil; in shade it gets drawn up to a height of eight feet, but in the open it does not exceed three. The flowers are a pleasant shade of pink. Other notable shrubs found here are: a Barberry with black stems, glaucous foliage which turns lurid colours in the autumn, and single dangling yellow flowers. The rather large fruits are coral-red (K.W. 5773). It is a good foliage bush, but not otherwise striking. A Potentilla, which in foliage looks like *P. fruticosa*, but has flowers at least twice as big, is, in full bloom, a noble sight, especially when growing in colonies. A large bushy Lapponicum Rhododendron, and a Lepidotum with purple flowers and leaves which take on quite brilliant tints in the autumn. A large Salix, quite a handsome shrub in flower, the erect catkins being 2–3 inches long, the male brick-red, the female fluffy and silvery; but the most interesting willows met with were the dwarfs of the wet zone.

In the alpine region are many beautiful flowers, most of which bloom in June with the Rhododendrons, though quite a number not till the heavy rains of July. Amongst June-flowering Primulas are *P. sino-purpurea*, *P. ninguida*, *P. atricapilla*, *P. Walshii*, *P. rigida*, and *P. microdonta* var. *alpicola*; later come *P. Cawdoriana*, *P. philoresia*, *P. Baileyana*, *P. pudibunda*, *P. Waltonii*, *P. pseudocapitata*, and one or two others. Of these, the following are definitely Chinese: *P. sino-purpurea*, *P. rigida*, *P. philoresia*, and *P. pseudocapitata*—or, at least, were first recorded from China; while the others are as definitely Himalayan, Tibetan, or, in three cases, new species.

The new-comers are *P. ninguida*—a rather blatant purple Nivalis; *P. Cawdoriana*, a charming species of the Amethystina series, not likely to be very hardy; *P. Baileyana*, a charming Rotundifolia from alpine cliffs; and a new variety, *alpicola*, of *P. microdonta*, which is

likely to prove a first-class garden plant. *P. Waltonii*, which has fragrant ruby-red flowers, looks to be a good doer, and is not in cultivation, and *P. sino-purpurea* has flowers of a wonderful periwinkle blue, quite unlike those of the Chinese plant, with which, however, it agrees in other respects. *P. pudibunda* is a fragrant dwarf alpine Sikkimensis, with bright chrome-yellow flowers, which as far as I know is not in cultivation either. The others, with the exception of *P. pseudo-capitata*, which has been known for some years in cultivation, are not likely to be much use.

In the sub-alpine meadows, below the forest line, are found several species; and it is here that Primulas occur in the greatest numbers. Such are *P. Florindae*, *P. microdonta*, *P. tibetica*; and, in the forest itself, *P. latisecta*, *P. Roylei*, *P. Maximowiczii* var. *euprepes*, and *P. szechuanica*. The last two are plants of north-west China, and it is rather surprising to find them so far west. *P. Roylei* is a well-known species of Nepal and Sikkim; *P. tibetica* is a typical Tibetan plant; *P. microdonta* was originally discovered in Yunnan, but is so rare that it has apparently never been found since; while *P. Florindae* and *P. latisecta* are new species, the former belonging to the Sikkimensis section, the latter to the Geranioides. The two last mentioned should both be good garden plants, and the same may be said of *P. tibetica* and *P. microdonta*, with all its colour varieties. Lastly, mention may be made of the beautiful fragrant mauve-flowered *P. Littledalei*, a rock-plant from 16,000 feet, one of the Rotundifolias, but not a plant which is likely to thrive with us!

There are numerous species of *Meconopsis* in the dry zone, both in the alpine and sub-alpine regions. One of the most abundant is *M. impedita* var. *Morsheadii*, a plant which, in one variety, extends 400 miles into China, but is not found west of the 92nd meridian. *M. simplicifolia* also occurs north of the Tsangpo, and therefore has a pretty wide range, on both sides of the Himalaya. In eastern Tibet it is one of the first to flower, opening early in June, with a yellow-flowered species of the section *Grandes*, allied to *M. pseudointegrifolia*, of which it is perhaps only a well-marked variety. At the same time, and also in the alpine region, there blooms the very rare Ivory Poppy (K.W. 5766), of which we found only seven examples. This may be a new species, or it may be a pale-yellow form of *M. simplicifolia*; at any rate it closely resembles that species in everything except colour. But in that case it is the first known example of a *Meconopsis* having the flowers either yellow or blue.

Another June-flowering species from lower altitudes is the lovely woodland blue poppy, *M. Baileyi*. This is a perennial species, and it is closely allied to the Chinese *M. betonicifolia*, and probably also to the little-known *M. superba* of Bhutan. *M. Baileyi* is fairly abundant in woods and thickets on both sides of the Tsangpo, at the eastern end of the Himalaya. A second woodland species is the new yellow-flowered dwarf, *M. Florindae*, which has an alpine relative in the rare Sikkim plant, *M. lyrata*; but whereas we have no hope of growing *M. lyrata*

in this country, there should be no great difficulty with a woodland plant like *M. Florindae*.

In July, the high-alpine Aculeatae flower, *M. horridula*, with its variety *racemosa*, and two new species, which I have named *M. Prainiana* (K.W. 5909) and *M. Cawdoriana* (K.W. 5751). The latter is a lovely little plant with the habit of *M. horridula*, and very fragrant sky-blue flowers. *M. Prainiana* is a robust grower, reaching a height of 3 feet, with pale watery-blue flowers, not fragrant. Both occur scattered on the screes, and are fairly common, but they are not likely to be of much use in cultivation. One other species, found only in the dry country, and then at the topmost limit of flowering plants, opens in July. It is a yellow-flowered species, closely allied to *M. brevistyla*, though probably too distinct to be regarded merely as a variety.

The meadow-plant association deserves a few words to itself. Meadow occurs chiefly in the wide, wet, comparatively level valleys which were formerly occupied by glaciers, between 10,000 and 13,000 feet, particularly in those regions where there are now no glaciers at all. These glaciers did not descend much below 10,000 feet, and there the valleys narrow to water-worn glens, more or less filled with forest. Above 13,000 feet the forest lining thins out, and one reaches the alpine region. The stream which flows through the valley is always lined with bushes of Hippophae, Berberis, Rosa spp., Lonicera spp., etc., forming dense thickets, under which grow such plants as the orange-flowered *Primula chungensis* in masses, clumps of *Meconopsis Baileyi*, drifts of violet Iris (one of the Sibirica type; it never quite gets out into the open meadow), and, in running water, colonies of the giant *Primula Florindae*.

On the comparatively level ground between the lining of thorn thicket which hides the stream and the fir forest which clothes the lower slopes of the enclosing hills is the open meadow. Here in June and July are acres of the soft yellow *Primula microdonta* (replaced at higher altitudes by the variety *alpicola* with purple- and red-flowered forms), and many species of Pedicularis, Chinese and Himalayan, such as *P. Elwesii*, *P. integrifolia*, and, in bogs, the brilliant gamboge *P. siphonantha*. In very wet places, too, *Primula microdonta* is replaced by little *P. tibetica*, and in drier places by *P. atrodentata*, which early in the year forms a sea of mauve, followed late in the year by the deep sea-blue of *Gentiana sino-ornata*.

Many other plants occur in the thickets, where they grow rankly during the rains, species of Cynoglossum, Impatiens, Thalictrum, etc., and, in the meadow, species of Aster, Eryngium, Allium, and so on. The boggy ground, too, is often covered with little tufted bushes of dwarf Lapponicum Rhododendron, growing on the edge of birch copse.



FIG. 21.—BIRCHWOOD WITH LAPPONICUM RHODODENDRON UNDERGROWTH.



FIG. 22.—RHODODENDRON SP. (TRIFLORUM) AND BIRCH COPSE IN
TSANGPO VALLEY.



FIG. 23.—TSETA DZONG, TSANGPO VALLEY.
Larch, Birch, Poplar, Rhododendron, Willow, etc., in mixed forest.



FIG. 24.—DRY COUNTRY, EASTERN TIBET
Primula sikkimensis by the river. Hippophæe, Berberis, *Rosa sericia*, etc.

THE LATE LT.-COL. SIR GEORGE LINDSAY HOLFORD,
K.C.V.O., C.I.E., C.B.E.

By F. R. S. BALFOUR.

IN the death of Sir GEORGE HOLFORD on September 11 at Westonbirt, his place in Gloucestershire, there has passed one of the most distinguished of English gardeners and certainly one of the most courtly of English gentlemen.

He was born in 1860 and was an only son. After leaving Eton he joined the 1st Life Guards in 1880. He served for twenty years, till 1921, on the Council of the Royal Horticultural Society. His pre-eminence as an orchid-grower was well known; I suppose no one has won more renown in that especial field of horticulture. Mr. H. G. ALEXANDER, who has had charge of the Westonbirt orchids since 1899, has contributed a paper (p. 29) which provides us with a history of this remarkable collection. To Sir GEORGE's enthusiasm has been added Mr. ALEXANDER's skill in hybridization and cultivation to produce an unsurpassed achievement. He also tells us something of the other plants for which the Westonbirt houses were famous, and which, like the orchids, were the envy and astonishment of all who saw them at our Shows.

Of the Arboretum at Westonbirt members of our Society who have not seen it will wish to hear. To some of us who had the privilege of Sir GEORGE's friendship, the recollection of long autumn afternoons with him in his woods will be an even more delightful memory than the Sunday inspections of the wonders of his houses of Cymbidiums, Cattleyas, and Cyripediums. Professor SARGENT and other tree authorities regarded it as the finest collection of trees and shrubs in Great Britain. Sir GEORGE's father, Mr. R. S. HOLFORD, began planting in 1829, and subsequently laid out the great Arboretum of 114 acres and planted innumerable rare trees down the wide rides of Silkwood, 400 acres in extent, with truly remarkable foresight, taste, and good judgment. It is indeed rare to find trees grouped and avenues laid out by one who undoubtedly must have visualized the landscape when they were to be mature specimens. The Arboretum of Westonbirt is unique in these respects, as it is also in the amazing number of species of broad-leaved and coniferous trees to be seen there in the greatest perfection of growth and setting.

In the first half of the nineteenth century Mr. R. S. HOLFORD, with Lord SOMERS and Sir PHILIP EGERTON, were enthusiastic pioneers in arboriculture, and it was largely owing to their friendship and inspiration that the third Earl of DUCRE began his famous collection at Tortworth, also in Gloucestershire, and the only rival to Westonbirt, to

which he devoted his time and knowledge from the year of his succession in 1853 to that of his death at the age of 93 in 1921.

Mr. H. J. ELWES, a not distant neighbour of Sir GEORGE HOLFORD, used to give advice to visitors from abroad, when asked what were the best starting centres in Great Britain for seeing the finest trees, that within twenty miles of Gloucester and Perth there were more remarkable collections than elsewhere in the island.

The estate of Westonbirt in early days belonged to EDWARD Duke of Somerset. It eventually passed to the Crewe family, and through his marriage with a Crewe heiress to Sir RICHARD HOLFORD, who was descended from an ancient Cheshire family. This Sir RICHARD was a Master in Chancery in 1693, as were his son ROBERT and grandson PETER; both succeeded him in the ownership of Westonbirt. PETER HOLFORD died in 1803, and was the grandfather of Mr. R. S. HOLFORD, the founder of the Arboretum, and Sir GEORGE's father.

Three houses have occupied approximately the present site. The first, a Tudor manor-house of modest dimensions, was demolished in 1818, and was succeeded by another, which in turn was pulled down in 1863 to make way for the present imposing structure. Sir GEORGE used to tell how that as a very small boy he himself laid the foundation-stone. The architect was VULLIAMY, who also built Dorchester House. The great collection of pictures, Italian renaissance furniture, illuminated manuscripts and other artistic treasures formed by that truly remarkable man Mr. R. S. HOLFORD in the course of his long life is splendidly housed in both of them.

The building of Westonbirt was finished in 1871. The house has a southerly aspect, with wide terraces before it, confined by parapet and balustraded walls. From the terraces a stretch of lawn, with trees interspersed with groups of fine shrubs, slopes down past the little thirteenth-century church to a small lake margined by choice growing things. Beyond is the landscape of the park and its noble elms of nearly every known species and variety.

Sir GEORGE HOLFORD succeeded his father in the ownership of the Gloucestershire and Wiltshire estates in 1892. For the last twenty years, and still more so when the death of King EDWARD relieved him of his duties at Court, did his garden and Arboretum become the greatest interest in his life. He procured plants of all the more recently introduced species, or raised them from seed, and gave much thoughtful care to the positions they were to occupy. The result to-day is seen at its best in the autumn weeks, when groups and individual specimens of Maples, Parrotia, Liquidamber, Cercidiphyllum, Sumach, and Berberis of every kind produce a blaze of crimson and yellow at Westonbirt, more brilliant than can be described, the like of which can only be seen in the New England States in their "Indian summer." Indeed, in our climate generally the more intense autumn-colouring trees of Eastern America, such as the scarlet of *Quercus coccinea* and *Acer rubrum*, and the lemon-yellow of *Acer saccharinum*, and the Hickories, cannot be compared with the hues these trees turn in their

native land ; Gloucestershire, however, seems to excel other English counties in autumn coloration. Theories advanced hitherto to account for this are inconclusive. Why are birch and rowan far more brilliant in Speyside than elsewhere in Scotland ? No one can give a satisfactory explanation of this annual physiological phenomenon. It was at this season that Sir GEORGE and Lady HOLFORD especially loved to have their gardening friends with them.

It is impossible to do more than indicate by a few names the astonishing number of species to be seen in perfection at Westonbirt. The *Cedrus atlantica* near the house is the oldest in cultivation, having been planted in 1847 from seed obtained two years earlier by Lord SOMERS ; it is now 92 feet high by 11 feet 8 inches girth. The *Cedrus Deodara* close to it was planted in 1832 and was probably one of the first batch of seedlings raised in this country ; it had reached in 1920 a height of 91 feet and girth of 9 feet 10 inches. The tallest *Pinus Ayacahuite* in the Arboretum is 70 feet high, and from the seed of this and other fruiting trees many young pines of the second generation are planted out. Of the several well-grown specimens of *Libocedrus decurrens* the tallest is 76 feet high.

Of broad-leaved trees the *Betula Ermanni* on one of the main rides is an unforgettable specimen ; planted in 1875 and now 62 feet high, its creamy trunk and branches are conspicuous against the dark background of a very tall *Pinus insignis*. The Maples at Westonbirt are legion, and in mid-October, when they have taken on their autumn magnificence, they contribute more largely than any other genus to this great pageant of colour. Two trees of *Acer cissifolium* fruit freely and Professor SARGENT in 1907 thought them larger than any he had seen in Japan. Of other Maples *Acer japonicum* and *A. palmatum* in all their varieties, *A. griseum*, *A. Henryi*, *A. diabolicum* (46 feet high and almost certainly the largest in Britain), *A. Davidi*, *A. syriacum* (an old tree), *A. rufinerve* var. *albo-limbata* (a variety introduced before the species) are all especially worthy of mention. The charm of Westonbirt, however, lies not so much in the number of species or the symmetry and size of individual trees, as in the supreme skill with which groups have been arranged, often with the native Yew and Box or other evergreens as background to form an unsurpassed setting.

In one part of the Arboretum known as the Down Covert, and in a corner of Silkwood, Sir GEORGE during the last twelve years has grown a collection of the rarer Rhododendrons which is quite worthy of comparison with those of Cornwall, Sussex, Wales, and Galloway. The settings for great plants of *Rhododendron Falconeri*, *barbatum*, *eximium*, *fulgens*, *Shilsoni*, *calophytum*, *sulchuenense*, and many more, were chosen by him with the same care that he devoted to the grouping of his other shrubs, and the background of Cypresses and Yews shows them off to the greatest possible advantage. Had he lived he would have made even greater use of the pockets of sandy soil suitable for ericaceous plants, which occur sparingly on the Oolitic formation of Westonbirt. He has raised thousands of young Rhododendrons from

seeds sent home in such bewildering profusion in recent years by collectors in China.

It is a gratification to know that a complete and descriptive catalogue of the trees at Westonbirt has been in preparation by Mr. A. BRUCE JACKSON, A.L.S., and this splendid volume, illustrated by 66 photographs of the best specimens, will be published by the Oxford University Press this winter. The collaboration in this work with Mr. BRUCE JACKSON, and his cousin and agent, Mr. DAVID LINDSAY, during the last six years has been an unfailing delight to Sir GEORGE, who, alas! will not see the book as a finished whole. It will be a fitting memorial to a great tree-lover.

Sir GEORGE served on the small consultative committee of four which is called together from time to time to assist the Office of Works in regard to the planting, ornamental and otherwise, in Windsor Great Park. He took a leading part in our deliberations, and the anxious thought he devoted to this work was characteristic of him. He was a keen member of the Garden and Rhododendron Societies, and welcomed the members of the latter at Dorchester House for their annual meetings.

The collection at Westonbirt, let us hope, will live long to commemorate a father and son whose enthusiasm for arboriculture was equal to their achievement.

The grace of character and person of that *preux chevalier* their host will be a vivid and lasting memory to the many who have enjoyed the hospitality of Westonbirt and the charm of Sir GEORGE's friendship.



FIG. 25.—PRIMULA SIKKIMENSIS AND PURPLE IRIS IN A TIBETAN MEADOW.

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FIG. 26.—RHODODENDRON AND ABIES FOREST IN TIBET.
A Luteum in background and 3-ft. scrub of an Anthopogon in the foreground.

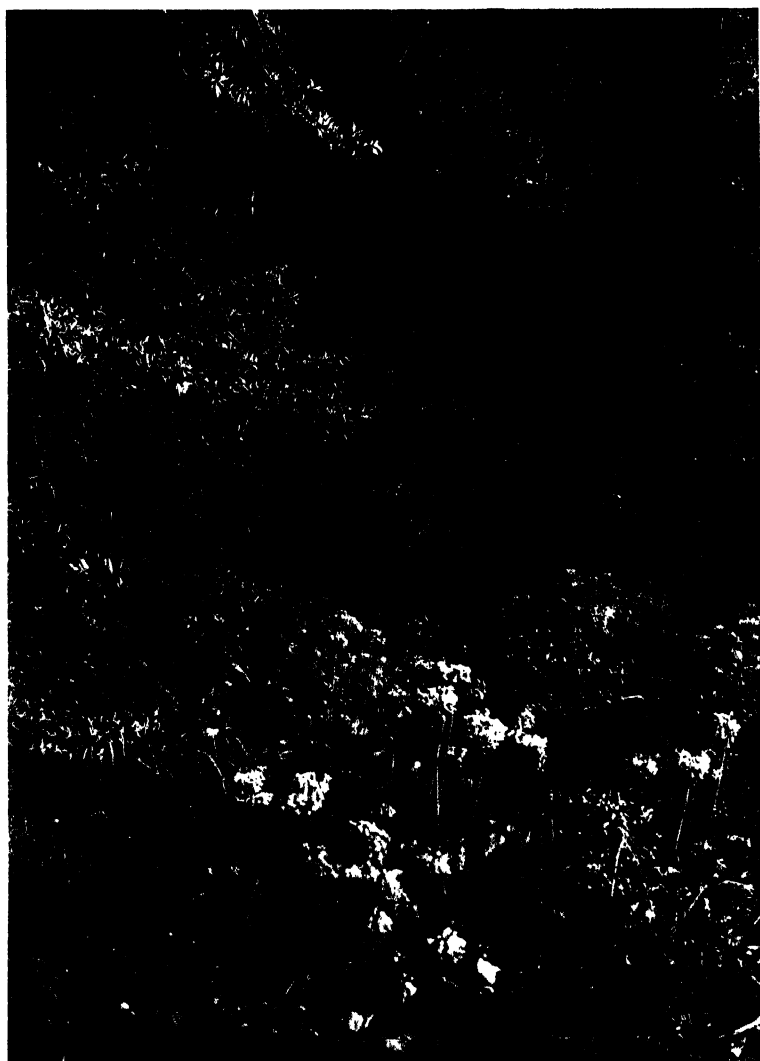


FIG. 27.—*PRIMULA FLORINDAE* IN TIBET.



FIG. 28.—SAND-DUNES ON THE UPPER TSANGPO.

WESTONBIRT ORCHIDS.

By H. G. ALEXANDER.

WESTONBIRT is one of the oldest Orchid establishments in the country, and for that reason alone special interest attaches to it. About 1840 the late "Squire" HOLFORD commenced growing Orchids, and was a party to sending out collectors in search of new species. The fine collection formed by him was contemporaneous with those of the illustrious JAMES BATEMAN and others long ago dispersed, and if little about it has been recorded, there still remain at Westonbirt a few plants which have been growing there for well over half a century. It is believed that *Cattleya Hardyana* was first flowered there, some months before it bloomed with Mr. G. HARDY at Timperley, to whom it was dedicated. It was at Westonbirt also, in 1843, that the remarkable flower-spike appeared which LINDLEY described as "bearing flowers of *Cynoches ventricosum* and *Cynoches Egertonianum* intermixed," and of which much was written in after years. Old records at Westonbirt show that the collection consisted of many well-selected plants of grand old species, rarely found in cultivation to-day.

When the late Sir GEORGE HOLFORD succeeded to the estate on the death of his father he established a continuity with the past by interesting himself in Orchids, and he devoted most of his spare time in his bachelor days to this fascinating and delightful hobby. The cultivation was carried on with the old appliances and by the old methods until 1899, when I went to Westonbirt to take charge of the collection. Sir GEORGE was then beginning to reconstruct the glass-houses and bring his Orchid-houses up to date. It was from this period that by modern development the collection began to take its place as one of the finest and most progressive in existence, and the reputation of Westonbirt Orchids throughout the civilized world became established. Owing to the rapid growth of the collection it became evident in 1907 that increased accommodation must be provided, so a range of new houses was erected some distance from the existing ones, the situation chosen being in an open field with only a wood to the north as a shelter against cold winds. To this block other houses were added as required, until twenty-seven houses in all were devoted to Orchids.

The first attempt to raise seedling Orchids at Westonbirt was made in 1900 and successfully pursued; this added to the intense interest Sir GEORGE took in his collection, and evidence of the success that attended these efforts may be gathered from the records of the Royal Horticultural Society, which show that nearly three hundred awards were made to individual plants from the Westonbirt houses. In addition to these, ten Diplomas were gained from the Orchid Club in

Manchester. From a cultural point of view success has been no less remarkable, as fifty-nine Cultural Commendations from the R.H.S. have been given in respect of individual specimens, and seventeen Lindley Medals, an award granted for high cultivation. Sir GEORGE'S first attempt to stage an Orchid group of any importance was made in 1902, when a Gold Medal was awarded, and the magnificent Veitchian Cup was won at the Temple Show in 1907 for his first exhibit of Orchids ever shown there. He exhibited large groups of Orchids at the Ghent Quinquennial Exhibition in 1908, the York Jubilee Show, and at the Royal Agricultural Society's exhibitions at Gloucester and at Bristol. The greatest effort, however, was at the International Exhibition of 1912, where the Westonbirt Orchids occupied a space of over 1100 square feet and were the outstanding feature of the show; they were generally acknowledged to be the grandest and most elaborate exhibition of Orchids ever seen in the history of Orchid cultivation. This exhibit will long remain in the memory of all those who attended that great event, and Sir GEORGE HOLFORD deserved the enthusiastic congratulations which he received when it became known that his exhibit had secured the King's Cup. At the same exhibition individual plants from Westonbirt won the William Bull Cup for the best hybrid *Cattleya*, and the Hye de Crom Cup for the best *Miltonia*. Other special Cups have been awarded to groups at many of the R.H.S. shows, and in addition to these Sir GEORGE'S Orchids have to their credit thirty-three Gold Medals, including the International Horticultural Exhibition large Gold Medal, the Lawrence Gold Medal, the Royal Agricultural Society's Gold Medal, York Grand Jubilee Gold Medal, Veitch Memorial Gold Medal, Manchester and North of England Orchid Society's Gold Medal, and the Royal Botanic and Horticultural Society of Manchester Gold Medal. These and numerous Silver Medals were awarded to exhibits between the years 1902 and 1926.

The Westonbirt collection of *Cymbidiums* is the finest in the world, and notwithstanding the high reputation he won for Orchids in general it is doubtful whether Sir GEORGE HOLFORD ever accomplished quite so great a success in horticulture as he did in the raising of the splendid new race of hybrids of this genus. Rarely has the horticultural world been so excited over a new race of garden plants as it was when these beautiful Orchids were first revealed to the public in 1922. The groups of them shown at Vincent Square have won great notoriety, but a visit to Westonbirt was necessary to appreciate fully the glory of them, where over a thousand spikes in great variety could be seen open at one time—a truly magnificent sight. Over fifty new *Cymbidiums* have been raised and named at Westonbirt; all descendants from the handsome *C. insigne* and the beautiful and unique *C. Parishii Sanderae* bought by Sir GEORGE from Messrs. SANDERS, who introduced these species about 1904. The majority of them have been given the names of birds: an exception is the hybrid named after myself, *Cymbidium Alexanderi*, Westonbirt variety, which was

awarded a Silver-gilt Lindley Medal at the Cymbidium Show last March.

The raising of this new race of Cymbidiums commenced in 1907. Owing to the war, however, little was heard of the results until 1922, for, as it may be remembered, Sir GEORGE did not exhibit during that time, although he was constantly flowering new and fine things. Had there been no war he would have staged a large group of these new Orchids in 1915. During that period Sir GEORGE was serving with his regiment and saw but little of his Orchids. The greatest difficulty was experienced in maintaining the collection, owing to the whole of the staff serving with the Colours with the exception of one unfit man ; but with the aid of this one man, two boys and two girls, the collection was kept in being, and that it suffered no irreparable damage has been made evident by the exhibits staged since the end of the war.

To attempt a description of such a collection in detail would be almost impossible, and one can only mention such leading features as Cymbidiums, Cattleyas—which in former days were the least satisfactory of all Orchids grown at Westonbirt—and Cypripediums, which have been raised there in thousands, and have equally contributed to the fame of this collection. Other sections also are no less noteworthy ; but perhaps the outstanding feature of all has been the wonderful specimen plants that have been grown and exhibited from time to time ; for example, *Vanda caerulea*, a single stem with over forty leaves bearing 2 spikes with 12 and 16 flowers ; *Cattleya Bowringiana* bearing 10 spikes with an aggregate of 198 flowers ; *Ada aurantiaca* with 40 spikes ; *Odontoglossum crispum* with 6 spikes and a total of 129 flowers ; *Odontoglossum* × *crispo-Harryanum* with 2 inflorescences from a single bulb, one bearing 24 flowers and the other with 11 branches and 49 flowers ; *Miltonia vexillaria superba* with 28 spikes and 138 flowers ; *Sophranitis grandiflora* bearing over a hundred flowers ; the magnificent specimen grown in a tub of *Cattleya Trianae* 'Hydra' with 97 flowers, and others far too numerous to mention.

By a fortunate chance, during a visit to Westonbirt of Her Majesty the Queen in August 1922 a new hybrid flowered for the first time. It was the result of crossing two superbly coloured Cattleyas both raised at Westonbirt. Her Majesty was pleased to accept the dedication of this new Orchid as a memento of her visit. With Sir GEORGE, *Laelio-cattleya* 'Queen Mary' was a special favourite, and it has proved one of the finest hybrids raised by him ; four of this cross have since received recognition from the Orchid Committee of the R.H.S. It was at Westonbirt in 1903 that the early experiments carried out with *Osmunda Fibre* as a medium for growing Orchids were watched with doubt and incredulity by the majority of growers in this country, as many had previously tried their hands with these materials and had had to acknowledge their non-success. During the experimental stages candid friends sent their note of warning, suggesting that unfortunate results would manifest themselves in the Westonbirt collection. These warnings were not without their use, as they served

to stimulate the very closest observations, with the result that in due time the handling of the materials was completely understood, and later cultivators generally commenced to follow the example set at Westonbirt. To-day the majority of epiphytic Orchids under cultivation in this country are grown in this particular material.

Much more might be written about this famous collection, but sufficient has been said to show that the record of the Westonbirt Orchids is indeed a remarkable one.

Another speciality of Westonbirt is the famous collection of *Hippeastrums* (*Amaryllis*), which has been continuously improved for the last 70 years. The flowers of this strain possess characteristics in which a descent can be recognized from the fine old species which it was the delight of Mr. R. S. HOLFORD to collect. The raising of these at Westonbirt has been systematically carried out and well-defined types developed, with the result that the collection boasts great variety, and has not merged into one large monotonous type. It would be difficult to imagine any class of plants which could make such a gorgeous display as the magnificent exhibits staged by Sir GEORGE HOLFORD in London and elsewhere. The Westonbirt *Amaryllis* have won the highest honours and have been acclaimed wherever they have been shown; they were one of Sir GEORGE's proudest horticultural possessions. *Clivias* also have contributed to the reputation of these noted gardens. They have been extensively grown at Westonbirt, where the hybridizing of them has been carried on for many years with excellent results. Another speciality was the fine collection of varieties of *Rhododendron javanicum*. The originals were bought by Sir GEORGE from Messrs. VEITCH of Chelsea. The flowers of these beautiful plants range through every shade from deep crimson and brilliant salmon to pink and white. Much hybridization has been carried out and the house devoted to them contains many flowered and unflowered seedlings from the original strain.



FIG. 29. THE LATE LT.-COL. SIR GEORGE HOLFORD, K.C.V.O.

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FIG. 39. THE GARDEN AT WESTONBIRT.



FIG. 34. WYSENBURY. THE GARDEN AND THE HOUSE.

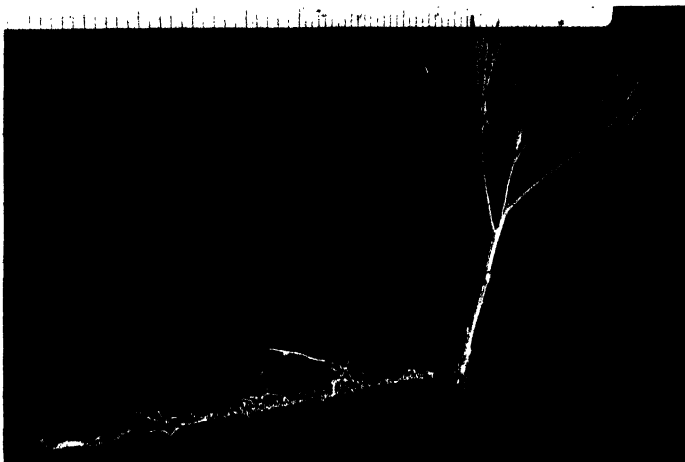


FIG. 32.—HAKEA SP.



FIG. 33.—CODIAEUM. TWO TYPES OF CUTTING.



FIG. 34.—APPLE CUTTING.

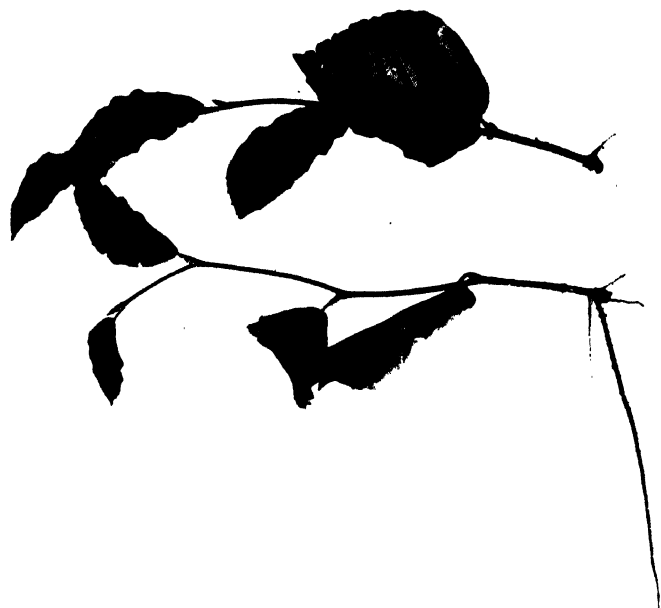


FIG. 35.—BEECH CUTTINGS.

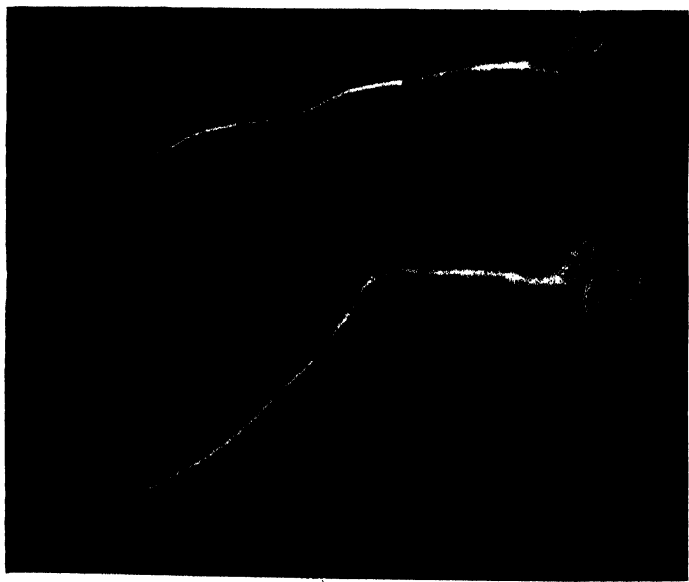


FIG. 36.—BENSERA SP.
On left, seedling. On right, cutting.



FIG. 37.—PENTAPTERYGIUM SERPENS SEEDLING.



FIG. 38.—PENTAPTERYGIUM SERPENS CUTTING.



FIG. 39.—RESTIO SUBVERTICILLATUS.
Cutting rooted. Shoot prepared.

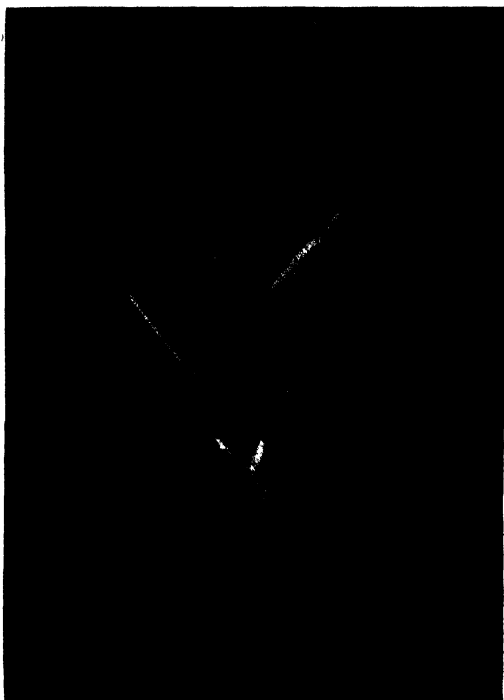


FIG. 40.—PHILESIA BUXIFOLIA

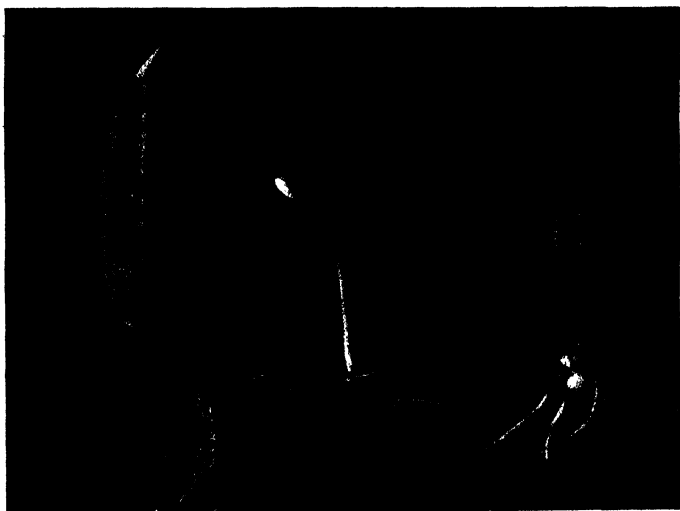


FIG. 41.—ZAMIOCULCAS SP.

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METHODS OF PROPAGATION.

By L. B. STEWART, Royal Botanic Garden, Edinburgh.

IN the propagation of plants a certain amount of care must be taken in providing suitable frames and apparatus. The propagating-frames should always be clean and have a healthy environment. In an ordinary propagating-frame where heat is not required, good drainage is necessary. This drainage ought to be covered with some loose material, such as leaves or sphagnum, to prevent the sand or soil compost from falling in amongst the drainage. Where heat, however, has to be brought into play, thermostatic control is the best. In large establishments where propagation of plants has to go on from one year's end to the other, thermostatic control is much better than valve control. Thermostatic control also does away with the hand of man, as it works automatically; thus a very steady heat is maintained both day and night.

It has been our endeavour in Edinburgh to place on record the best months for propagating plants, and this work is still going on. In 1919 my late Chief, Sir ISAAC BAYLEY BALFOUR, asked me to take a species out of every genus in the Garden to find out exactly at what time of year these trees and shrubs would propagate most readily. This work has been completed, and the work which is being done at the present time is going through all the Natural Orders, taking three or four at a time, and running through all the Genera and Species of these Natural Orders. This work, as you can well understand, is on rather a large scale and will take many years yet to complete.

On inserting cuttings into a propagating-frame the first thing that the cutting does is, not to form callus as a great many people imagine, but to heal up the cells which have been cut through in the stem. The healing generally takes place by decomposition of the cells which have been cut through. After this healing has taken place, then callus formation, in a great majority of cases, begins. In some of the *Loniceras* large calluses are formed, and they swell up to enormous dimensions. In some other stems, such as *Rudgea*, where the callus formation generally covers the wound entirely, this usually arises from the cambium layer; but it must not be supposed that the cambium layer is the only part of the stem which can produce callus formation. In many of the *Bignoniaceae*, where there are large medullary rays in the stem, these medullary rays can form callus, and do so. In cutting through this callus formation longitudinally, the section shows a great many curvatures. Callus formation can be made to grow in any direction by wound stimulus. In some plants it attains such dimensions that it becomes more or less a malignant growth, and the cutting can be kept in life for a number of years by allowing this callus formation to grow and multiply. However, if quick propaga-

tion is required this large callus should be cut off. This allows the parent cell to come once more into control, and rooting takes place almost immediately. Many plants will be found to have rather an awkward way of rooting, the root growing out of the stem at an angle of 90° (fig. 32), and if they are not handled at the earliest possible moment, by the time they have to be inserted in the pot the roots will have become so long and brittle that they are apt to get broken. In the propagation of cuttings in Edinburgh, pure sand is the medium used for rooting all subtropical and hardy plants. Sand is a good medium, because air can pass freely through it, and this is one of the essentials in propagation. A dibber is never used for inserting the cuttings; they are taken between the forefinger and thumb and pressed gently into the sand, just deep enough to make the cuttings stand erect. We never use any pressure to firm the sand, as the watering does all the firming necessary. In this mode of propagation the plants when rooted must be removed at once, as the sand contains little food material, and if they are not potted immediately they very soon die. When plants are to be taken straight out of the frame in which they have been propagated it is generally the rule that we use a little loam, leaf-soil, or peat, according to the class of plant; and after these cuttings have rooted in this medium they are allowed to remain in the frame until the time of planting out.

The removal of leaves from the stems of cuttings is a practice to be condemned, as a great amount of time is wasted in cutting off leaves; the cutting itself generally sheds them if they are not required (fig. 33). In *Buxus Wallichiana*, which is by some people considered difficult, it will be found that the transition between the old wood and the current year's growth is very marked, and to propagate this plant quickly the propagator must be certain that he is working on the young wood. In some of the Acanthaceae it will be observed that many cuttings do not take time to form callus, but that the roots, which have their origin in the fibro-vascular bundles, burst through in a kind of square from the stem. Some of the hard-wooded stems, such as Apple, seem to be found difficult with some people. In the finer varieties of Apple it will be found that these stems take a little longer to produce roots compared with the ordinary cooking Apple (fig. 34). In the propagation of the Double Whin, or Gorse, stem propagation must always be resorted to, as this plant cannot be produced from seed. *Erinacea pungens* is considered to be a delightful rock-plant, and it can be raised readily from seed; but rarely does one find seedlings which are good flowerers—at least, not for many years, and in some cases never. Vegetative propagation, therefore, must be adopted. With some of the trade horticulturists this plant takes 15 months to propagate, but in Edinburgh we can produce roots in 21 to 30 days. Cuttings can be rooted, established, and ready for sale the same year. In the propagation of Beech, roots are produced very readily if cut at the right season of the year (fig. 35). The time for taking cuttings of Beech is when the last two leaves of the year's growth are beginning to develop, and if

cut at this particular time it will be found that the plant roots in 17 days. It would not be a good plan to attempt to grow Beech from cuttings for timber, as I do not think that they would ever form timber trees. In the propagation of *Schizophragma*, which is one of the climbing *Hydrangeas*, some people imagine that the wood which is crawling up the side of the wall and forming aerial roots is the best kind of wood to take. This plant in Edinburgh gave considerable trouble, until we found that the lateral branches of the climbing wood rooted quite easily. The Double-flowered *Gypsophila*, which, as most people know, is grafted in the nursery, can be propagated quite easily by cuttings. It roots readily if taken when the growths are very young. The benefit of propagating from cuttings is that, should a severe winter kill down the plants, if any growth starts in the spring then you know that it is the Double *Gypsophila* instead of the single-flowered one. In the propagation of Camphor, or any plants which contain alkaloids, oils, or anthocyanin, the propagator is up against a difficulty. Where a large percentage of camphor is present in the stem it will be found that this plant is more difficult than many of its "brothers" with a less percentage. It is, therefore, necessary in these stubborn cases to etiolate the stem anything from 16 to 20 days. The etiolation seems to dissipate the colour or the camphor, as the case may be, and allows the cells which form the meristematic tissue to work; whereas, before, they were blocked or full of camphor, or there was so much colour in the stem that the cutting was prevented from rooting.

In the propagation of some plants it is not essential that all cuttings should be taken at the node. In the propagation of *Clematis* it will be found that internodal cutting is much quicker. Here, again, we have a very sharp line of demarcation between the node and the internode, and it should be the propagator's aim to get at least an inch below the node, where he is perfectly sure that he is working with the internode. In some plants, such as *Acanthus*, where you get a very versatile plant, the internode can form both roots and shoots.

Then we come to plants which have highly developed hypocotyls, such as *Bursera* (fig. 36), many of the *Proteaceae*, and some of the *Sterculiaceae*. It will often be found that these hypocotyls are danger zones for handling these particular plants, as in *Bursera* and *Hakea*. *Bursera* has a great many lenticels on its hypocotyl, and is very impatient of being covered up; so much so that the horticulturist has to take care to expose the whole of the hypocotyl when potting. If, however, cuttings are taken of this plant, the young plants can be handled with impunity. Many hypocotyls make swollen structures. Such we have in *Sterculia rupestris*—the Bottle Tree. The swollen hypocotyl forms a growth something like an Indian club. In cuttings, this growth form entirely disappears, and is never again present on that plant. The only way to get back to that growth form is by the reproduction from seed. In *Pentapterygium*, however, where the swelling takes place on the primary tap-root (fig. 37), it will be found that on cuttings the swollen portion again appears at an early stage in

the young plant's life. Therefore, in the case of the plant with the swollen hypocotyl, when it is once removed it is removed from the cutting's life altogether, whereas in *Pentapterygium* it can again be formed on the young vegetative plant (fig. 38). Although many plants are impatient to their hypocotyl, the gardener must not lose sight of the fact that the hypocotyl is very useful to many plants, as in the ordinary Cabbage, where it has the power to form roots and assists in the feeding of the plant. There are many other examples where hypocotyls are useful for pushing out roots for feeding purposes.

Then we come to plants which have large piths. In some there are chamber piths, and in others piths which die in a very short period. There are piths which disappear and the stems become hollow, and many other kinds of piths. Where we come into contact with large piths, it will be found that in many genera, such as the large-leaved *Rhododendrons*, this large pith has a deterring effect on the propagation, and to propagate them by cuttings the growing point must be cut away and one of the lateral buds be allowed to grow. After growth is finished it will be found that there has been a great reduction in the pith on cutting the branch close to the main stem. By the reduction in pith the wood portion is allowed to get a better food supply for the formation of roots. *Senecio Hectorsi* is another plant with a large pith.

In propagating monocotyledons, *Dracaena*, which is one of the easiest, grows generally if the apex is taken in an upright position, and the cutting is kept intact right through the life cycle of the plant; whereas in *Costus* it will be found that the buds are formed on the side, and that at once these young plants grow out from the stem, forming a plant on either side. In *Smilax* similar growth formation takes place, and after a short time both *Costus* and *Smilax* will have cast off the parent which gave them birth. In *Bamboo*, which is a very easy plant to propagate, it will be found that the parent plant has to be treated a year or so before cuttings are taken off, and this by pollarding the main shoot when it has just about reached its full growth. This pollarding forces all the food material into the lateral branches, and by so doing the propagator has then very vigorous shoots to work with. The same treatment should be adopted for *Restio* (fig. 39). If the point of the shoot is removed it will be found that all the vigour goes into the lateral growths, and after a time, if the cuttings have not been taken at an earlier stage, the grower will find that these young growths have formed roots on the parent plant. In the propagation of *Asparagus*, selection of shoot is necessary, and if successful propagation is to be obtained the propagator must get right down the stem to the scale-leaf region. It will be found that on inserting this region in a moist, warm compost, a bud very soon develops, which forms itself into a small rhizome, from which roots are sent out. Here, again, is an example of the parent plant disappearing at a very early stage in the young plant's existence. In the propagation of *Lilies*, which do not naturally form bulbils, it will be found that after flowering has taken

place, if a portion of the flowering stem is laid into a moist case horizontally, bulbils are formed quite readily. These are very much better from a horticulturist's point of view than raising from seed, as a year's growth is generally gained over the seedling. In *Philesia* (fig. 40), propagation is very simple. Small cuttings should always be selected, and here again is an example of bud formation at the base of the cutting. In many instances two small rhizomes are given off, and in a short time it will be found that the parent plant has disappeared. Instead of getting one plant from your cutting you get two travelling in reverse directions.

In the propagation of plants from leaves many are easily rooted, but they may take a considerable time before they give off shoots. In *Coleus* some produce shoots at an early period, whereas in certain varieties they take a considerable time before shoots are formed. In the Rose, roots are easily produced, but it must be propagated at the earliest time of the year, so as to ensure shoot formation before the end of the season. If this plant has to winter without a shoot it generally dies. This is not a form of propagation which I would ask any person to adopt, as it is well known in horticulture that there are better methods of propagating Rose than by leaf cuttings. In many of the *Gesnerads* leaf propagation is very successful. In *Alloplectus*, roots are first given off, but at an early stage the plant forms shoot-growth. This growth is somewhat like a seedling, or what you expect to find in a seedling—juvenile character. The ordinary Fig roots quite readily from the leaf, but this is another mode of propagation which I would not advise any person to adopt, although it shows the possibilities of leaf propagation. In many plants, such as *Phyllogathis*, by cutting the main veins a great number of plants can be reproduced. In propagating this sort of leaf it depends entirely upon the requirements of the individual. If he, or she, requires a large number of plants, then the cutting of the midribs is beneficial, as one gets a larger amount of progeny. Whereas if only one plant is required, then the leaf may be inserted as a whole, and from the whole leaf a stronger plant is got, and also a plant which is nearer adult than juvenile. In the propagating of *Brownea* it will be found that a large woody root-stock is formed, and this woody root-stock must be kept growing and fed by repotting until it reaches a size to almost fill a 4-inch pot. On the third or fourth year after this woody root-stock has grown to great dimensions the old leaf begins to die backwards from the apex, and the leaf will have disappeared altogether before the young shoot is thrown up. The young shoot is thrown up into the air with considerable rapidity. Just as the parent plant makes all its growth in about a fortnight or three weeks, so this young growth takes about the same time to form its length for the year. In *Zamioculcas* (fig. 41) the leaf pinna immediately on insertion does not form roots, but all the food material which is in the leaflet descends towards the base and forms a tuber. After the tuber has formed, then root formation takes place, and these roots go on feeding the tuber until the time comes for shoot formation, when it will be found that the tuber

is in a good healthy state to support the young growth. In *Acanthus*, the plant, as I said before, being versatile, any portion may be used for propagation. It is not always necessary to have the blade of a leaf for propagation, as in some cases the leaf-stalk produces the plant.

Ornithogalum caudatum naturally reproduces itself by formation of small bulbs, which have their origin at the base of the scale on the dorsal side. These small bulbs are held firmly and grow upwards on the point of a central strand of growing tissue. They force their way up until they escape at the top of the scale-leaf. A transverse section shows the mode of movement and also the young plants at different positions, the younger ones being near the base. Artificial propagation, however, forms a different kind of growth. Being more numerous, and also elongated, these young plants do not assume their fat, globose habit until after the first year. The difference between a scale-leaf and an ordinary foliage-leaf is that the foliage one gives roots first, then shoot growth, while the scale-leaf gives shoot growth first, then roots.

In propagation by roots it is sometimes somewhat difficult for a gardener to know whether he is working with a true root or an underground stem, but, practically speaking, to the gardener all the underground portion of the plant is more or less looked upon as root, and it may be difficult to tell, unless someone is about to cut a section, whether one is working with a root or not. There are plants which form scale-leaves on their underground stems, and these are easily distinguished as stems, or if shoot formation is regular at each side of the stem, then in both cases one can be pretty certain that one is working with an underground stem. In the roots of *Drosera* (fig. 42) it is difficult to get bud formation at any given point, irrespective of how the roots are inserted in the rooting compost. If laid horizontally, budding may be got pretty near the basal end, and if inserted perpendicularly, then buds may there again be produced in the same way. *Acanthus*, however, forms a very good subject for root propagation. It will be seen that the young plants develop readily towards what might be looked on as the apex, but what really is the base portion. Here, again, we have the parent only connected to the young plant for a very short time, until the young plant has absorbed all the nourishment from its parent. It then cuts itself adrift. In many species of *Prunus* it will be found that gouty growths form on the roots, and selection of these gouty growths is the best for root propagation. In *Phalaenopsis* young plants are sometimes produced naturally, but they can be produced artificially if wound stimulus is given to a portion of the root.

Where horizontal branching occurs, as in *Gardenia*, *Napoleona*, and some conifers, it will be found on propagating branch cuttings that there is a great tendency for the branch, after rooting, to remain a branch. It does not for a time attempt to form a central, straight, upright growth, with radial branches, and the plant may attain a con-

siderable age and still remain a branch. This can be seen in the number of pendulous Larch and other conifers which one finds named *pendula* or *nana*. In Gardenia the plant with the upright growth and horizontal branches goes on growing and has not attempted to flower, whereas in the branch cutting it remains dwarf, forms more foliage, and flowers every year. These branch plants can be kept for many years, but eventually a bud starts on the root which gives the upright growth, and begins to pull all the nourishment into itself, and the branch portion becomes suppressed and dies. Much the same is the case of Napoleona, but the adult plants flower freely.

In the case of Spruce there are placed on the branches plastic buds, and if the point of the shoot is removed or broken over, one or other of these buds starts into growth, which again forms upright and radial branches. *Cryptomeria japonica spiralis* (fig. 43) must be propagated vegetatively, as seed from this plant gives the ordinary *japonica*. Pinus, which is not a horizontal-branching plant, is considered by some to be difficult to root. The difficulty is in the amount of resin which it exudes, but after the resin has been removed from the end of the stem, until the resin canals, which have been cut through, are empty, the rooting process becomes simple, and it then forms callus and roots like an ordinary cutting.

The inverted cutting is a well-known subject. It can be seen in nearly any establishment where green wood is used for staking or supporting other plants, and I have seen Laburnum, Beech, Hazel, and Willow (fig. 44) growing in this inverted position. A curious thing which happens is that the inverted portion never puts on any secondary thickening, and always remains the same thickness. It seems clear that the inverted position is reversing at every season. This may have to do with the non-thickening of the stem.

In conclusion, I have to thank Mr. REGINALD CORY for the financial assistance given to Edinburgh Royal Botanic Garden, in providing a Research Student, Dr. EDITH PHILIP SMITH, to carry out this work ; also Professor W. WRIGHT SMITH for providing facilities, and for his criticism on the work done. I would also take this opportunity of thanking Dr. GRAHAM, without whose help this work would not have been so successfully carried out, and likewise the members of the staff in the Propagating Department for the zeal and keenness which they have shown in assisting with the experimental work.

NOTES ON AMAZONIAN VEGETATION.

By ELEONORA ARMITAGE, F.R.H.S.

WHERE the River Amazon discharges into the ocean there is a very large deltaic island called Marajó, which divides the stream. The bulk of the river flows out to sea along the northern shore of the island between myriads of smaller islands, while the southern branch follows a tortuous course through the "Narrows," between Marajó and the continent. Leaving that island to the north, the Amazons is joined by a large river, the Tocantins, flowing up from Central Brazil, after which it is called the Pará river till it reaches the ocean; Pará city, or Belem do Pará, being on the right bank.

So we travelled west into the heart of the South American continent on the broad tawny flood, with the low island of Marajó showing dimly to the north. Beginning at about 47° west longitude, we eventually reached 60° west, travelling between the 1st and 3rd degrees of south latitude. During a short stay at Pará we visited the old Portuguese Fort, dating from A.D. 1615, and explored a large area of primeval forest behind the city, which has been set aside as a natural Park and Reserve and is called the Bosque Rodrigues Alves. It actually contains a manati in one of its pools, an ugly seal-like member of the Sirenia, inhabiting the sluggish creeks up the Amazon. There is a very beautiful Botanical Garden at Pará, with a fine selection of indigenous trees and other plants; it includes a zoological garden and a museum containing, besides objects of natural history, a wonderful collection of pottery, utensils and weapons belonging to extinct native Indian tribes, besides those of more recent inhabitants.

Next we steamed for more than a hundred miles through narrowly winding intricate river-ways, often close inshore, so deep is the stream. The slowly passing pageant of the forest is so fascinating that all day one sits on deck, gazing through field-glasses, first on one side and then on the other. Flowers can be plainly distinguished on the forest trees and also on the bushes, climbers and *cipos* or lianes, yellow, red, purple or white. The young foliage at the ends of the branches on the tall forest trees is so vividly coloured, red, yellow, pale green or whitish, that it might easily be mistaken for flowers.

Palm-trees of many species are extremely abundant at the forest-edge bordering the river along the lower reaches of the Amazons, and especially in the "Narrows." They are quite the most beautiful feature of the vegetation, and differ much in their growth, form, and colouring. The highly polished surface of the fronds, as they clash in the breeze and scintillate in the bright sunshine, gives a wonderful freshness and sparkle to the scene. Some, soaring upwards, with huge trunks 80 to 100 feet high, have great feathery crowns of palmate

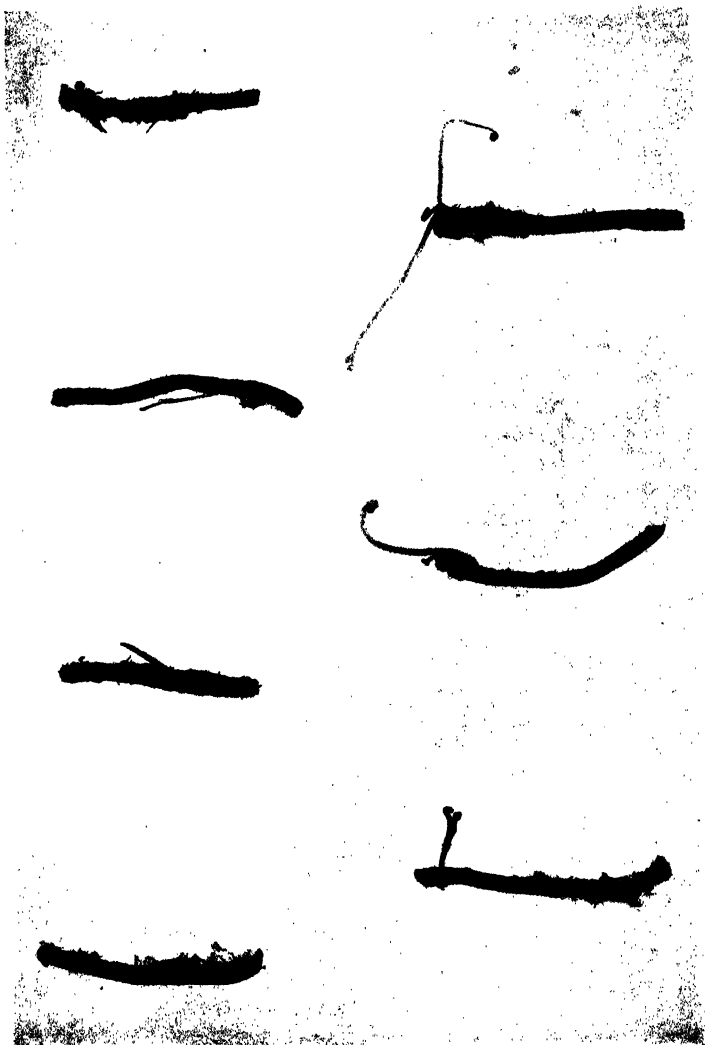


FIG. 42.—DROSER A CUTTINGS.

[To face p. 40.]



FIG. 43.—CRYPTOMERIA JAPONICA SPIRALIS.



FIG. 44.—WILLOW CUTTING.

or pinnate leaves ; others, slender and graceful, 20 to 30 feet in height, lean out over the water's edge at various angles. Some are low, branching from the ground with domed circles of outward arching fronds ; others, with weak stems set with recurved prickles, clamber up the tree-trunks. With regard to colour, the whole forest is one effect of green, but the greens are varied, and the palms contribute many shades, dark green, blue-green, yellow-green and silver-green.

A splendid and very frequent tree is the Mirití Palm (*Mauritia flexuosa*), with a tall stout stem and crown of immense fan-shaped leaves, 9 feet across, with petioles 13 feet long ; one leaf is a burden scarcely to be carried by one man. It bears huge branched ropes of fruits, each brown fruit about the size of a small apple ; the sweet orange-coloured pulp surrounding the hard kernel is used for making sweetmeats, and a beverage is prepared from the juice ; the pith of the trunk is farinaceous and the fibre from the leaf-stalks is made into cords and hammocks. The native Tupi Indians and the Caboclos or half-caste Brazilians use this palm in many other ways. The large trunk is used as a float to their small hut-dwellings ashore. One end of the trunk is made fast on shore and the light wood floats at high tide or high river, while at low tide or low river, with a difference of 30 or 40 feet, the barefooted Indians, and their delightful brown families, walk to and fro to their canoes on its smooth surface. The native houses are built on piles formed of palm-trunks above the river-level, with steps up to the huts ; ribs of the palm-leaves form the walls, and a light roof is made of the great pinnate leaves of the Ubussú Palm (*Manicaria saccifera*) ; these are 20 feet long and are arranged to overlap and so carry off the tropical rains. The long, flexible leaf-blades of the Mirití Palm when split up are used for making hats and all sorts of basket-work. The large shady hats of natural straw-colour with woven patterns of a greyish-brown tone, made double, one inside the other, are much used in Brazil as a protection from the sun ; sunstroke being unknown on the Amazons, solar helmets are never used.

The Assaí (*Euterpe oleracea*) is a very elegant slender palm, growing commonly, in clumps, by the water-side, 15 to 20 feet high, with delicate light-green pinnate leaves, swaying to and fro in the breeze and leaning out over the river's edge. The pretty feathery tassels of cream-coloured flowers were abundant in December. From the small round blue-black berries, which are like sloes in size and colour and have a thin sweet pulp, is made the Assaí wine, a favourite beverage of the Indians, so these palms are to be seen growing by every native hut along the river.

Yet another palm is the Vegetable Ivory (*Phytelephas macrocarpa*), which has a heavy brown oval fruit, about 2 inches long. These nuts are extremely hard to cut ; they are made into buttons in Pará and in Paris.

The Javary (*Astrocaryum Jauari*) is a tall palm bearing many rows of hard, pointed spines on the stem, 7 to 10 inches in length. When

the fallen trunks are met with on the forest floor, hidden by a dense litter of branches and leaves, they are a great danger. However, there is a use for the spines. Indians requiring a light at night collect the oily fruits of the Ucu-uba (*Virola sebifera*), which are the size of a cherry. These nuts are threaded on a long spine, the top one is set alight, and there is a fine torch till all are burnt.

One of the finest forest palms is the Urucurí (*Attalea excelsa*). Tall, with a crown of twenty or so great feathery leaves rather a dull blue-green in colour, the leaves reach a length of 25 to 30 feet. It bears heavy clusters of nuts, a thousand together, which, when dry, are burnt to make a smoke for coagulating the rubber latex. These *Attaleas* grow in the forest in company with the Seringas or Rubber Trees.

The general level of the forest as seen from the deck of the steamship is about 100 feet high, with some taller trees raising their crowns above. The Amazons valley is very wide and flat, and, though there are low cliffs here and there of red, yellow, or white sand about 50 feet high, the banks are generally bordered by long alluvial islands, submerged at high-river; and though the rains had not begun, many tracts of forest were under water as far as could be seen under the dark canopy of the trees. This forest, with the bottom never dry, is called *Ygapô* by the Indians, meaning "forest full of water," and it is very difficult to explore. A traveller may venture in in a canoe, tie the latter up to a tree, and then wade about in four feet of water or mud, on a surface of interlacing roots which give very insecure foothold. The innumerable branching creeks, *ygarapés*, have to be crossed on tree-trunks. This word in the Tupi language means canoe-path, *ygara* = canoe, *pé* = path. In the tidal waters the forest is flooded twice daily, and tidal action is felt as far as the town of Obidos, 500 miles up-river. At low-river the stream of the Amazons flows down at four miles an hour, bearing many logs on its surface. These are the remains of trees growing close to the water; after a time the current becomes too strong for them and they fall into the river from the low muddy islands. Near Santarém we saw a great forest-tree fall into the river with a resounding splash. We were often inclined to take these black logs for alligators.* Sometimes the foundation of a cliff 60 feet high will be undermined at high-water, and the forest slides down, revealing white clays or red sands, a pleasant contrast to the general verdure, or great stretches of the river-bank calve off and drop into the water, leaving bare banks called *estirões*.

One encounters great floating sheets of aquatic vegetation, *Eichorneas* and *Pontederias* with large fleshy leaves with inflated petioles to help in floating, and spikes of mauve flowers, which have become detached from the mass of vegetation fringing the banks. Among riparian aquatics one sees large masses of coarse grasses, rooting in mud and floating out on the water; a species of *Gynerium* is called Arrow-Reed, as the Indians use the long, smooth leaf-stalks as the shafts

* We seldom saw the Amazonian caimans from the ship, but at Manáos a few of the passengers went up the creeks in small boats and shot them.

of their arrows. The shores were often fringed with immense stretches of a tree Aroid called 'Aninga' (*Montrichardia arborescens*). It grows up out of the water in dense thickets, the stout green stems rising from 6 to 15 feet above the surface. On the stems are the scars of fallen leaves and in a tuft near the top are the large bluntly arrow-shaped leaves. The wide-open white flower-spathe showed the yellowish-white spadix within. Fish and turtle are said to eat the fruits. Behind the Arums grow dense thickets of a bush called 'Veronica,' and clumps of the graceful Otter Bamboo (*Guadua macrostachys*) ('Taboca de Lontra') and willows. Flocks of large brown-crowned birds, 'Ciganas' (*Opisthocomus cristatus*), were constantly flying in and out of this bush vegetation; numerous herons and egrets were fishing from the margin, some of the latter lemon-coloured with blue beaks; kingfishers were diving from projecting branches; black and orange troupials chattered in the trees, building their nests in colonies. Flocks of parrots flew across, and occasionally a pair of long-tailed blue and scarlet macaws.

Higher up the river, when palm-trees became less frequent, there were often groves of small white-stemmed trees called Emba-uba (*Cecropia peltata*), crowned with large long-stalked palmate leaves; these are pure white underneath, so that when stirred by breezes the young white leaves resembled flowers. This is a tree the sloth likes to climb. It is only possible to mention a few of the forest-trees seen on our passage: low trees with white flowers; many climbers with orange or yellow flowers; taller trees with long racemes of lilac flowers on leafless twigs; and others with hanging clusters of tubular red flowers. As a rule flowers are not conspicuous in the forest. The variety of growth, the branching and massing of foliage, and the varied shades of green showed that there is an immense variety of trees, even in the fringe discernible from the river. The Andiroba (*Carapa guianensis*), a tall tree, often seen, with large ovate leaves, conspicuously coloured red and orange when young, simulating flowers, yields a valuable, bitter oil. The Silk-Cotton Tree (*Ceiba pentandra*), the 'Sama-úma,' is one of the tallest, grandest forest-trees, 150 to 200 feet high; its great crown towering above the forest level. It has huge buttresses, out of the flat sides of which table-tops are cut. Branching begins at about 100 feet. The Indians call the buttresses '*sapo-pema*' = flat roots, and they really are exserted roots. SPRUCE* writes that he has seen a buttress reaching up as far as 50 feet, and thinks they may have originated as a kind of scaffolding to keep the crown above the reach of inundation. One often saw the great Ceibas festooned with bush-ropes, or *cipos*; indeed, they were rarely free from these incumbrances, hanging down from the lowest branches. Seeds are dropped, probably by birds, among the Bromeliads and Orchids growing on the horizontal branches. The young plant throws down an aerial root; when this reaches the ground nourishment is carried up, more roots are sent down, until the host-tree is entangled with them, and the interloper, Ficus or Bignonia, strangles it at last.

* *Notes of a Botanist on the Amazon and Andes*, vol. i., p. 22.

Bignonias display their showy orange and yellow tubular flowers at the summit of the host-tree.

Brazil nuts (*Bertholletia excelsa*) are an important product of this country ; here they are called *Castanhas* or chestnuts. The *Castanheiro* is a lofty tree with bare trunk and a flat-topped crown of branches and foliage, not dome-shaped like the *Ceibas*, reaching to 200 feet in height. The fruit is a huge woody capsule in which the wedge-shaped seeds are arranged. The latter have a hard brown coat and oily endosperm. The fruits, weighing 1 to 2 lbs. and up to 6 inches in diameter, when mature, fall from the tree, and coming down with great force would kill a man if he were struck on the head. Flowers open in January, and the fruits are ripe in December. We saw quantities of the nuts being dumped into the hold of the ship ; to prevent heating on the voyage there are long canvas air-funnels and the nuts are turned with shovels every two days.

Brazil-nut trees are sometimes grown in plantations, but the natives collect the nuts in the forest, opening the fruits with an axe, as there is no natural opening ; birds and monkeys can only enjoy the nuts when the woody capsule has rotted away.

Rubber is still exported in quantity from Brazil, though the trade of the country has been ruined by the competition of rubber grown in the Eastern Tropics, where by cultivation it can be obtained so much more cheaply than in the trackless Amazonian forest. The *Hevea (Hevea brasiliensis)* is a tall, handsome tree, when seen growing by the river-bank, with a straight white stem except for the lower part, which has a dark rough bark. There is a light crown of foliage, yellowish-green leaves, long-stalked and trifid ; the seeds are broadly oval, mottled in shades of dark and light grey and brown. Few attempts have been made here to form rubber plantations. The wild rubber-trees are sought for in the forest by the Indians. The rubber-gatherer starts out early, scrambles through rough, often submerged, tangles, wades or swims innumerable *ygarapés*, crossing on slippery logs, with danger from numerous snakes and also from the Cannibal Fish (*Piránha*), which has a formidable mouthful of teeth. Reaching a rubber-tree, he makes three or four sharp oblique cuts with his "machadinha," a small iron axe, sticking a little tin cup, "tigelinha," into the bark at the base of the cut, into which the rubber-milk or latex slowly oozes. An experienced Seringuero can visit over a hundred trees in a day, wide apart though they are in the dense mixed forest. After a round of about three hours he starts out again over his route, taking his "balde," a bowl made of the calabash-fruit (*Crescentia cujete*), in which to carry home the latex. After emptying all the cups he has from 1 to 2 ounces of pure latex. At home he coagulates the rubber-milk in the smoke of palm-nuts. The "defumador" or smoking-place is a hole in the ground, over which is placed a "boião" or funnel ; alongside is a "bacia" or basin containing the latex. He lights a fire of twigs and rubber scrap, on the top of which are piled the dry nuts of the Urucuri (*Attalea excelsa*) Palm ; when a strong blaze is established the funnel is put on, causing

a great draught, and the smoke rolls up in a column. He dips a paddle or stick into the latex-bowl and quickly twirls it over the smoke, and within a few seconds the latex is coagulated and turns cream-colour and the paddle is covered with a thin layer of rubber. This process is repeated hundreds of times till the latex is finished, and the layer of rubber may reach 1 to 2 inches in thickness after three hours' work. The paddle is then supported on sticks, as the rubber is still very plastic. When dried on a stick the rubber forms a "pelle" or ball, with a central hole where the stick was. Each day more rubber is added till the ball becomes a large one.*

It is this slow process and the palm-nut smoke which produce the Pará rubber, said to be the best in the world. The method of the Indian cannot be imitated in the eastern plantations, as the valuable palm-tree does not grow there, so the latex is coagulated chemically by means of acetic acid. The Indians waterproof their boats and garments by spreading the heated latex over them.

It was a pleasant change to spend a few days at Manáos on the Rio Negro, a thousand miles inland; to be able to follow up some of the tributary streams and drive and walk in the forest, on rough tracks and paths, with extensive views over vast undulating forest country. Here we were in the midst of Ferns, Tree Ferns, Bamboos, and Palms, with examples of many tropical genera of flowering plants and trees, such as Melastomas, Hibiscus, Crotons, Acalyphas, Screw Pines, Musas, Plumierias, Scitamineae, Zingiberaceae, Dracaenas, Flamboyants, and many others. The gardens and squares in the towns were well planted and the Indians by the river brightened the balconies of their tiny houses with scarlet Geraniums in kerosene tins. There we saw Banana plantations and *Feijões* or Kidney Beans of all sorts, and a Cacaoal or grove of Cacao-trees (*Theobroma Cacao*), from which cocoa and chocolate are obtained. The trees were bearing little white flowers, projecting from the trunks and larger branches, while the large pods which contain the cacao-beans were just ripening and were hanging all over the stems and branches. At one spot we landed and walked across a savannah to visit a lagoon where the great Amazonian Water-lily, *Victoria regia*, was growing. Indian boys with sharp, long-handled knives waded in and cut leaves for us. The fresh leaves are very thick and apparently fleshy, armed with long, sharp prickles on stalk and undersides of leaves, but when dried they are hardly as thick as tissue-paper.

In conclusion I must mention the Mandioc (*Jatropha Manihot*), the staple food of the Brazilians and cultivated everywhere. It is a herb with a large tuberous root containing 30 per cent. of starch, and is very nutritious. The root, cut in slices and sun-dried, is baked in an oven (forno) to expel the poisonous juice, ground into a rough meal or flour—hence its name, "farinha"—and is eaten either raw or baked. Immense quantities were brought to England during the war to mix with wheat and cornmeal for bread-making.

* See *The Lower Amazon*, Algot Lange, Putnams, 1914.

CONTRIBUTIONS FROM THE WISLEY LABORATORY.

XLIX.—THE pH VALUE OF CELL SAP OF FLOWERS.

By B. H. BUXTON, F.L.S., and F. V. DARBISHIRE, Ph.D., M.A.

SOME experiments have been made by us at the R.H.S. Gardens at Wisley on the reaction of the cell sap of variously coloured flowers.

It is generally recognized that the anthocyanins of the cell sap are blue in neutral or faintly alkaline media, turning red on acidification, and it was thought that the varying colour of flowers might be due to varying reaction of the cell sap, as, indeed, has often been suggested, though we have been unable to find any records of experiments undertaken to prove this point. This view is held by Prof. H. E. ARMSTRONG, who informed one of us last summer that he had not published anything on the subject, but since writing this article we find a note to that effect in the last number of this JOURNAL, 51, p. 305.

I. METHODS.

The methods of making the tests, as given below, were only gradually evolved. The experiments were begun in the summer of 1924, and it was not till towards the end of 1925 that the present methods were finally adopted for systematic use. Since the latter date all the results as given in the tables have been arrived at by similar methods and under similar conditions.

The flowers to be tested were dried at about 25° C. for several days, and finished off in a desiccating chamber at room temperature. The dried petals were then ground to a powder, and kept in well-stoppered specimen-tubes till wanted.

Of the dried petals 0.5 gram was macerated in 100 c.c. of neutral (pH 7) distilled water for 24 hours, filtered clear, and 20 c.c. of the filtrate tested at once for its pH value by the methods described further on.

After standing for a few days the remainder of the filtrate invariably became clouded, the suspended particles gradually settling down, until in five or six weeks the sedimentation was complete, leaving the supernatant liquid perfectly clear.

From two to three months after the first test, 20 c.c. of the clear fluid above the sediment was decanted or pipetted off and tested. In many cases, as will be seen from the tables, there was a considerable change in the pH value between the first and second tests.

In a week or two after the second test the remainder of the extract in some cases was filtered clear from the sediment and the filtrate

tested. This third test showed no further change in the pH value in the cases tested, so was not carried out in the later tests made, and the results are not included in the tables.

There could be no question of contamination by growth of micro-organisms, as traces of thymol were always added to the extracts in sufficient quantity to prevent this. Moreover, the flocculation was always typically colloidal and not bacterial. The sedimentation is doubtless due to proteins in colloid solution, which gradually flocculate out spontaneously, as all colloids in solution will do sooner or later. The colouring matter in the extract is not colloidal and does not flocculate out.

To test the clear extracts, 20 c.c. are taken and mixed with 20 c.c. of neutral distilled water, making the final dilution for the test equal to 1 gram of dried petals to 400 c.c. of water. If the extracts are more concentrated their natural colour in many cases will mask the colour of the indicator.

Since the more concentrated sap in the petal would undoubtedly be buffered, the difference between the pH value of the sap and that of the more diluted extract is probably negligible. Even without any buffering the difference would not be considerable.

The 40 c.c. of diluted extract is then divided into four beakers, 10 c.c. in each; the beakers can be conveniently called A, B, C and D.

Beaker A is titrated with $N/100$ H_2SO_4 , the indicator being methyl red. Methyl red begins to show colour at pH 6, and reaches its full colour at pH 4. The reduction is pushed to about the medium tint indicating pH 5 approximately.

Beaker B is titrated with $N/100$ $NaOH$, the indicator being phenolphthalein. Phenolphthalein begins to show a red colour at pH 8, and reaches its full colour at pH 10. The reaction is pushed to about the medium tint, indicating pH 9.

An example taken from our notebook will explain the method of calculating the pH value.

Beaker A requires 0.7 c.c. of acid to reach pH 5, and *beaker B* requires 1.3 c.c. of alkali to reach pH 9. Then $\frac{1.3 \times 100}{2.0} = 65$ per cent. of alkali for total range between pH 9 and pH 5. Multiplying this by four, we get 260, or 2.6 for the range of the four points 9 to 5, and $9 - 2.6 = 6.4$, which would be the pH value of the extract, the decimal points being arithmetic not logarithmic values as is the case with integers.

To test beakers C and D a universal indicator is used, two drops to each beaker, and the pH value is estimated from the colour. In our example it was taken as pH 6.

Beaker C is now titrated with $N/100$ H_2SO_4 until it reaches orange-red = pH 5.

Beaker D is titrated with $N/100$ $NaOH$ to a blue colour, indicating pH 9.

In the example, beaker C took 0.6 c.c. of acid and beaker D 1.2 c.c. of alkali; so $\frac{1.2 \times 100}{1.8} = 67$ per cent. of alkali for the total range and 2.68 for the four points, *i.e.* $9 - 2.68 = \text{pH } 6.32$. $\text{pH } 6.25$ is the average of the three tests, and can therefore be taken as approximately correct.

The advantage of the triple estimation is that each one acts as a check upon the others, and, on account of the occasionally rather disturbing colour of the extracts, one method may be found to be more reliable than another.

II. OBSERVATIONS.

The flowers tested may be divided into three groups:

- A. Flowers predominantly blue . . . (Table I.)
- B. " " red . . . (Table II.)
- C. " either blue or red (Primrose,
etc.) or purple-red (Foxglove) . . . (Table III.)

A Series.

TABLE I.

Flowers predominantly Blue. Series A.	Test 1. At once.	Test 2. After two to three months.
Delphinium	6.75	8.50
Lupin (yellow)	6.00	8.50
" (blue)	7.00	8.50
Iris (yellow) (Pseudacorus)	6.00	8.25
" Kaempferi (purple)	6.25	7.50
" sibirica (purple)	5.50	7.50
Viola (blue pansy)	6.25	8.00
Campanula muralis	7.25	8.50
Anchusa	7.50	8.00
Aconitum Napellus	7.25	8.50
Clematis Jackmanni	6.50	8.00
	<hr/> 72.25	<hr/> 89.75
AVERAGE	6.57	8.16
<i>Exception.</i> Gentiana acaulis	7.25	6.50

With regard to Series A, in which no really red flowers are known—although some of the garden varieties may show a pink or magenta tinge—it appears that, after the colloidal sedimentation, the alkalinity of the extract is very decidedly increased, by about $\text{pH } 1.5$ on the average.

The probable explanation seems to be that certain ions adsorbed by the colloid in solution are released as these flocculate out, the released cations in the A series being chiefly K^+ ions, leading to

increased alkalinity of the solution. In the cell itself the pH value would approximate to pH 8 and not to pH 6.5 as the first test would seem to indicate. *Gentiana acaulis* appears to be an exception to this rule.

It may be noted that the presence of proteins in solution is always regarded as a disturbing factor in estimation of colours by indicators.

B Series.

TABLE II.

Flowers predominantly Red. Series B.	Test 1. At once.	Test 2. After two to three months.
Rhododendron (white) . . .	7.00 ?	5.00 ?
(red) . . .	6.50	6.00
Rose " (red) . . .	5.50	6.50
(white) . . .	6.00	5.75
Paony (dark red) . . .	5.50	4.50
(pale red) . . .	5.50	4.50
(white) . . .	6.25	4.50
Poppy, Oriental . . .	5.00 ?	5.00 ?
	47.25	41.75
AVERAGE	5.90	5.22
<i>Exceptions.</i>		
Begonia (red) . . .	7.25	8.00
Pelargonium (pale red) . . .	6.00	7.00
Poppy, Shirley (pink) . . .	5.25	7.75
	18.50	22.75
AVERAGE	6.17	7.58

In this series of red flowers there is more irregularity than in the blue series, but there seems on the whole to be a slight tendency towards increase of acidity, *i.e.* increase of H^+ ions, after sedimentation: There are, however, three very marked exceptions, in which there is increase of alkalinity to about the same extent as in the blue series.

C Series.

In Series C (Table III.) three groups of flowers appear to be alike, in that there is little or no change in the reaction of the extract after the secondary sedimentation. Moreover, the reaction appears to be approximately the same, irrespective of the colour of the flowers, with the possible exception of the white Foxglove, against which a ? has been placed, as there may have been some error of manipulation in this case.

There are two exceptions, each one of a separate type. The Linum (blue and red) extracts show approximately the same reaction, but after sedimentation there is a distinct increase in alkalinity ranging them with Table I. rather than with Table III.

Anemone blue (' St. Brigid ') and red (*fulgens*) are sharply marked off from the others of the series, since the extract of the blue is distinctly

TABLE III.

Flowers either Red or Blue or Purple-red. Series C.	Test 1. At once.	Test 2. After two or three months.
Primrose (red) . . .	6.50	7.00
" (white) . . .	6.50	7.00
" (blue) . . .	7.00	7.00
Salvia (blue) . . .	7.50	7.50
" (red) . . .	7.50	7.75
Foxglove (purple-red) . . .	7.00	7.00
" (white) . . .	6.00	5.00 ?
" (yellow) . . .	7.50	7.50
	55.50	55.75
AVERAGE . . .	6.94	6.97
<i>Exception 1.</i>		
Linum (blue) . . .	6.5	7.5
" (red) . . .	6.5	8.0
<i>Exception 2.</i>		
Anemone (blue) . . .	7.0	8.0
" (red) . . .	6.25	6.25

more alkaline than that from the red ; the blue ranging itself with Table I. and the red with Table II.

III. GENERAL CONSIDERATIONS.

From a general survey of the tables it may be gathered that, on the whole, the alkalinity of the extracts is greater in the blue series A than in the red series B, although, when tested at once, the difference ($A = ca. pH\ 6.5$, and $B = ca. pH\ 6$) is hardly appreciable, and it is not till later on, after the secondary sedimentation ($A = ca. pH\ 8$ and $B = ca. pH\ 5.5$), that there is sufficient difference between them to enable one readily to understand that the difference in colour is due to the difference in reaction between the two groups.

On consulting Table III., Series C, we find that both before and after sedimentation the reaction is practically neutral ($pH\ 7$), and it may be reasonably inferred that in the petal itself as a whole the reaction is approximately neutral. In neutral solution the anthocyanins are blue, and the question naturally arises: "Why are there any red flowers in this group?" As an answer to this it may be suggested that the cells of the red flower have the power of selecting the ions which penetrate the cell membrane.

This question of selective permeability has been thoroughly gone into and discussed by Stiles ("Permeability," 1924). Stiles, however,

does not enter into the matter of anthocyanins and their colours, but shows by various methods how cells in general may possess selective permeability.

The most classical example comes from the animal kingdom: the red blood-cells of mammals contain much K and very little or no Na,

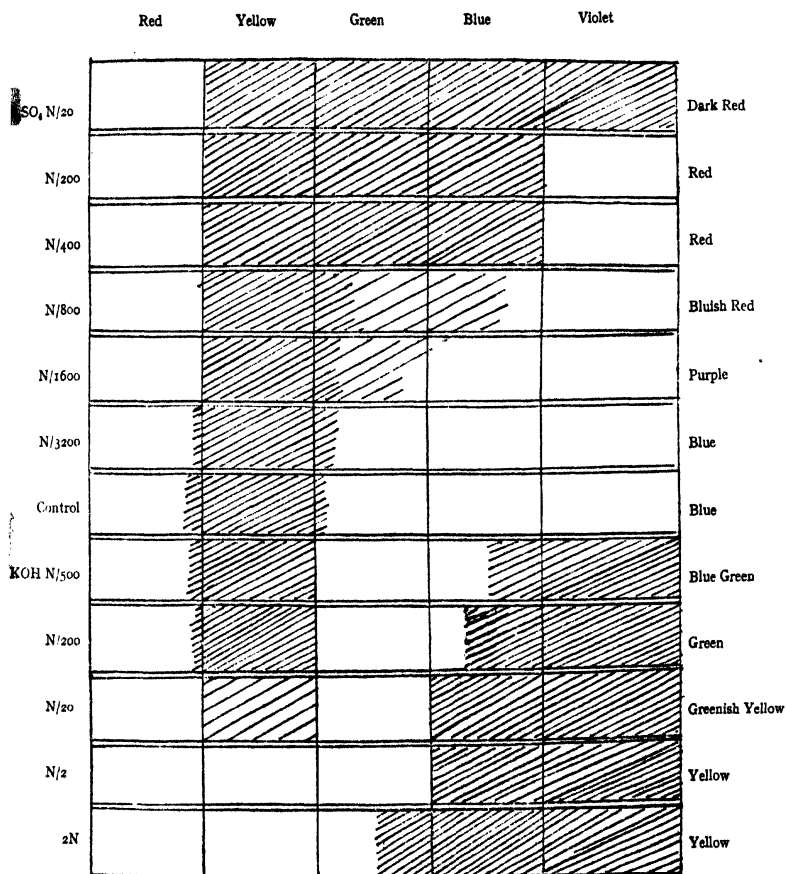


FIG. 45.—DIAGRAM OF SPECTRUM OF EXTRACT OF RED PETALS OF PRIMROSE.

whereas the serum in which they float contains much Na and little K. (Bayliss, "Colloid Reports," Part II. p. 134, 1921). Here the red blood-cells and the serum can be separated from each other on a large scale, and analyzed individually; a proceeding impossible for fixed vegetable cells, for which other and more complicated methods have to be devised (see Stiles).

Assuming, then, that cells may possess selective permeability, it can be inferred that the cells of the red Primrose or *Salvia* have the

power of admitting the anion (*e.g.* Cl or other acid ions), but excluding the cation (*e.g.* K⁺ or other alkaline ions) of the neutral sap which is supplied to them by the vessels.

This would leave an excess of K⁺ ions for the sap in the vessels outside these cells, but since there is no return of the sap, but simply loss of moisture by transpiration, the sap in the vessels outside these cells would remain more alkaline than normal, and a mixture of the cell sap and the external sap would approximate again to neutrality. That this is the case is indicated by the behaviour of the red petals of Primrose and Salvia, which on gradually drying out lose their red colour and take on a blue or brown tinge, causing the dried and pulverized petals to appear blue in the Primrose and brown in Salvia, the latter tint in Salvia being probably due to rapid fading of the blue, which often occurs among the anthocyanins. Red Linum also (Exception 1) dries blue like the Primrose, but the red Anemone remains red on drying, and this appears to be due to acidity of the sap. See Table III., Exception 2.

Among the red Primroses there are some which have a distinctly bluish tinge and may be called blue-red. On examining under the microscope a fresh petal of one of these blue-red flowers, the majority of the cells are found to be red, while others are distinctly blue. There are no blue-red cells, and it appears that some of the cells possess the power of excluding the K⁺ ions, while others have lost it. Although each individual cell is either red or blue, the general effect to the eye is blue-red. If the blue cells are in large majority the general effect is blue. Even in the best blue Primroses there are a few red cells to be found, especially on the underside of the petal.

These observations lend additional support to the theory of selective permeability.

Linum, Table III., Exception 1, differs only from the Primrose and Salvia in that its extracts become more alkaline after the sedimentation, and one can only account for the red flowers by assuming selective permeability. As already mentioned, red Linum on drying out loses its red colour and the pulverized dry powder has a purple hue.

Of the three exceptions in the red series, Table II., Pelargonium and Shirley Poppy dry out red and Begonia a reddish-brown, although the sap in each case is distinctly alkaline after the secondary sedimentation. No explanation can be offered for this at present, unless the red cells in these flowers also possess selective permeability, in which case, should a mutation with loss of selective permeability arise, as probably occurred in the Primrose, there is no obvious reason why they should not exhibit varieties with blue-red or blue flowers. But this hypothesis does not account for their drying out red instead of blue.

Figure 45 is a chart of the spectrum of the red Primrose at varying degrees of acidity and alkalinity. The chart was made out several years ago with the aid of a small pocket spectroscope and extracts

from fresh petals made in slightly alkaline tap-water, so the individual spectra are rather too much on the alkaline side, and can only be taken as approximately correct.

However, they show clearly enough that in strong acid all the light is absorbed except the red. On weakening the acid the absorption band gradually disappears in the violet and then in the blue and part of the green, with a general effect of blue. Soon after alkalinity is reached another absorption band appears in the violet and blue, until in very strong alkali the original band disappears altogether and the general effect is yellow.

THE AZALEA LEAF MINER.

Gracilaria azaleella Brants.

By W. E. H. HODSON, A.R.C.S. (Dept. of Plant Pathology,
Seale Hayne Agric. College, Newton Abbot, Devon).

INTRODUCTION.

THE small Tineid moth, *Gracilaria azaleella*, is a native of Japan, in which country it lives on both cultivated and wild species of Azalea. The moth has been known to occur in Holland since 1912, and has been a pest of major importance in Holland and Belgium for a number of years. More recently serious damage has been reported in America, the moth having been imported from the first-named countries, and also possibly direct from Japan. As far as can be ascertained, this moth was unknown in Great Britain until its discovery in a nursery at Torquay in September 1925. This discovery was noted by METCALFE, and the present writer was asked to investigate the trouble.

A batch of about one hundred plants of *Azalea indica*, imported from Belgium several months earlier, were found to be heavily infested by the pest, all stages of which were present. Unfortunately about half of the consignment of plants had already been retailed, and it was therefore not possible to prevent further spread of the pest. Furthermore, observation showed that the moth was already established firmly in another nursery ten miles distant from the point of introduction; while during the summer of 1926 the insect was found to be breeding under outdoor conditions at Exeter on small bushes of *Azalea Hexe*. In this latter case it was not possible to ascertain with any certainty whether or not the insect had passed the winter in the open; but it seems highly probable that it had done so. Anyone who is familiar with the damage that the allied species, *Gracilaria syringella*, does to lilac under similar conditions will realize the significance of the moth becoming firmly established here.

In view of the serious nature of the injury occasioned and of the fact that the moth is undoubtedly rapidly increasing in this country, it was decided to investigate in detail the life-history and to explore the possible means of control.

DESCRIPTION.

Adult, Fig. 50.—Head tufted, covered with scales, white to dull grey in front. Antennæ longer than body. Labial palpi long, curved, ascending, second joint scaled, terminal joint pointed, black at apex. Posterior tibiæ smooth scaled. Forewings elongate, basal portion and apical fringe mainly black, a wide yellow blotch running down apical three-quarters of costa. Hindwings grey, heavily fringed. Both pairs occasionally unicolorous. Length, 4.5–6.5 mm.

Egg.—Elongate oval, much flattened. Chorion soft, reticulate, with a metallic sheen in some lights.

Young larva, Fig. 46.—Transparent. Head triangular, large, one-third length of entire body, mouth-parts prominent. No legs visible. Body hairless and tapering. Length, 0.6 mm.

Old larva, Fig. 47.—Greenish-yellow. Head pale yellow-brown, darker in front, much smaller in comparison to rest of body than in the preceding. Body not tapering except at extremity, and covered with sparse pubescence. Normal legs present. Length, 5–6 mm.

Pupa, Fig. 48.—Greenish-yellow, darkening to brown later. Head produced to a point. Body elongate, with a few scattered hairs, antennæ protruding beyond end of abdomen. Length, 4.5–5.5 mm.

LIFE-HISTORY.

The female lays her eggs singly on the undersides of the leaves, alongside the midrib or one of the veins. One to five eggs are usually laid on each leaf, but occasionally more. It is not quite certain as to how many eggs are normally laid by a single female. In captivity as many as forty were obtained, and it is possible that the usual number is considerably higher.

These eggs hatch in four days into minute legless larvæ, which have large and powerful heads. Each larva enters the leaf immediately beneath the egg and forms a typical elongate mine or tunnel, eating a space between the upper and lower surfaces of the leaf. While in the mine the larva undergoes several moults, and eventually, when about one-third grown, presents the appearance of a normal caterpillar. At this stage the burrow is vacated and the larva travels to a fresh leaf, where, instead of entering the tissues as previously, it curls up the tip of the leaf, webbing this to the remainder and living in the cavity so formed. Several fresh leaves may be thus utilized before the larva is fully grown, all feeding being done from the inside of the cavity.

When fully fed the larva proceeds to yet another leaf, usually choosing one so far free from damage. One side of this leaf is drawn up in a longitudinal direction, and here a cocoon is spun. This choice of an undamaged leaf for pupation is apparently made in order that the moth, when emerging, will find itself still on the plant, as leaves damaged by the feeding of the larvæ very frequently shrivel and fall to the ground prematurely. After a short period the adult moth emerges from the end of the cocoon, the empty pupa-case usually being left protruding from this in the process.

SYMPTOMS OF ATTACK.

Attacked bushes are more or less defoliated, the amount depending on the severity of the attack, while many of the leaves remaining on the plants appear to have been badly scorched. Closer examination, however, shows that this appearance is due to the damaged portions of the leaves having turned brown, while investigation of one of the leaf-mines or drawn-up tips will usually reveal the presence of the small yellowish larvæ. At the same time, a gentle jarring of the plant frequently dislodges a few adult moths, which fly rapidly

about and finally settle in a very characteristic attitude, with the forepart much raised, anterior and middle legs prominently displayed, and with their long antennæ vibrating at a rapid rate.

The common commercial practice is to keep *Azalea indica* in the cool house, bringing the plants under heat a few at a time in order to force the blooms, the plants being then sold in pots. Unless the infestation is heavy, damage to the plants is not very apparent as long as they remain in a cool house. However, as soon as they come under heat, adults commence to emerge freely, egg-laying takes place, and the plants soon show evidence of the serious injury already described. The attacked leaves commence to drop from the bushes, and instead of making blooms the plants become severely defoliated, in extreme cases being actually killed by the attack.

A single complete generation of the moth was found to occupy almost exactly two months, either in a heated glasshouse in winter, or in a cool house in summer. It is therefore probable that at least four and probably five broods of the moth occur annually, under conditions met with in this country.

CONTROL METHODS UNDER GLASS.

Hand-picking.

Individual bushes, slightly attacked, may be gone over by hand and all leaves showing signs of injury removed. While this is possible for the private owner, who has perhaps half a dozen pot-plants, the method is obviously totally inadequate for use by commercial growers. Efforts were at first confined to attempting to find a satisfactory spray fluid, but eventually it was found that recourse to fumigation produced a more complete control.

Spray Fluids.

1. *Lead arsenate wash*.—Half a pound of lead arsenate powder to ten gallons of water.

Two sprayings were made at an interval of fourteen days. The method did not prove entirely satisfactory, but, provided that the application is made very thoroughly, particularly on the undersides of the leaves, and repeated a number of times, many of the larvæ can be killed.

The efficiency of the spray depends entirely on the thoroughness of the application and on the length of time during which the poison remains on the leaves. It is only when the larva leaves the leaf-burrow and webs up the tip of another leaf that it is at all vulnerable. If the leaf is already coated with the arsenate the larva will be poisoned, but otherwise there is nothing to hamper its continued development, even if another spraying is made subsequently.

2. *Nicotine, soft-soap wash*.—One ounce nicotine, four ounces of soap, to ten gallons of water.

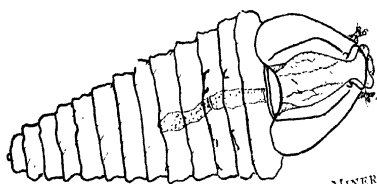


FIG. 16.—FRESHLY HATCHED LARVA OF AZALEA MINER $\times 125$.

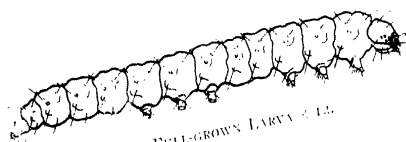


FIG. 17.—FULL-GROWN LARVA $\times 15$.



FIG. 18.—PUPTA $\times 15$.

[To face p. 56.

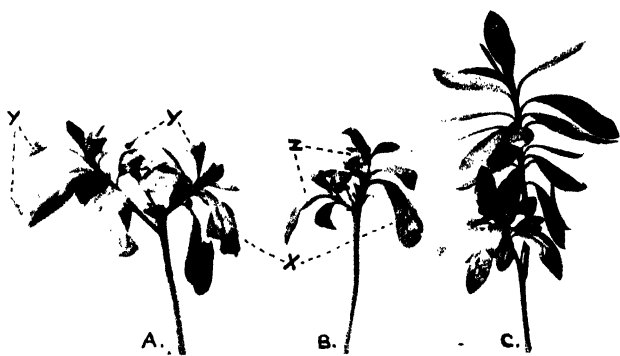


FIG. 49.—SHOOTS OF *AZALEA INDICA* $\times \frac{3}{4}$.

A and B, attacked by moth, stunted and defoliated; C, healthy leaves;
(x) mined, (y) curled by larvae, (z) containing pupae.



FIG. 50.—ADULT *AZALEA* MOTH $\times 6$.

[To face p. 57.

Two sprayings were made with an interval of fourteen days between them. After this, repeated applications were made at more frequent intervals, but proved almost a complete failure. Practically no dead larvæ could be found; however, a few dead adults were picked up beneath the bushes after each application, having probably been hit directly by the spray fluid.

Fumigants.

In view of the fact that control by spraying is rendered difficult by the concealed life led by the larvæ, attempts were made to find a suitable fumigant to deal with the pest.

1. *Calcium cyanide*.—The use of calcium cyanide as a greenhouse fumigant, as opposed to the commoner sodium and potassium salts, is becoming daily more common for a variety of reasons. One of the great advantages which it possesses over the two last-named substances is the ease with which it is handled. The requisite quantity is merely weighed out and scattered evenly over the floor of the house, when the gas is slowly given off without recourse to water and acid. It should be remembered, however, that while Azaleas will stand the dosage indicated below, many of the more delicate glasshouse plants would be liable to severe scorching at this strength and should therefore be removed prior to commencing the operation.

Several dosages were tried, and the one finally decided upon as giving the best results was 5 ounces of calcium cyanide per 1000 cubic feet for fourteen hours. The results were on the whole disappointing. In no case was a hundred per cent. kill of the larvæ registered, and an increase in the quantity of cyanide used was found liable to cause injury to the plants. While repeated applications of this fumigant would in all probability keep the pest in check, it would not be likely entirely to eradicate it.

The fumigations were carried out under normal glasshouse conditions and also in confined spaces, the latter being known as "box" fumigation. "Box" fumigation is the more advantageous method, for several reasons. In the first place, by this method leakage of the gas can be to a large extent eliminated, such elimination being impossible in any but very well-constructed glasshouses. As the duration of the fumigation is a factor of great importance, when dealing with such a resistant insect as a lepidopterous larva, the great advantage obtained is obvious. At the same time the fumigation can be carried out in the dark, an essential feature, even during the day-time, and, further, there is no necessity to move a large number of plants, which would be the case if the fumigation were carried out in a mixed house.

A fumigation-box should be included in the equipment of every nursery. The box is exceedingly easy to construct, the essential feature being that all joints, including the door, should be made gas-proof; further, the timber used in the construction should be well seasoned, in order to eliminate the danger of subsequent warping.

The capacity of such a box will depend, of course, on the amount of fumigation likely to be carried out. It is advisable if possible to arrange for the capacity to be a multiple of 100 cubic feet, as this saves much time when calculating the amount of fumigant required for any given dosage. A convenient internal measurement is 5 feet square by 8 feet high, giving a capacity of 200 cubic feet. A trap-door should be fitted in the side and top of the box to ensure thorough ventilation at the close of the fumigation.

2. *Tetrachlorethane*.—Tetrachlorethane is a substance which is worthy of more general use in glasshouse fumigation. The gas is far less dangerous than cyanide to human beings, and, as the substance is available in liquid form, it is easily stored, handled, and measured. Used against the insect under consideration it proved much superior to cyanide.

The fumigations were carried out under "box" conditions, and, provided that the usual fumigation precautions are observed and that the plants are fairly damp at the root, no danger of scorching is to be feared. As with the cyanide, an extensive range of doses was tried, the quantities of substance used and the time of exposure being varied. The strength which was finally decided upon as giving the best results proved to be $\frac{1}{4}$ pint of tetrachlorethane for the 1000 cubic feet. The liquid is poured on to the floor of the fumigation chamber and the plants exposed to the gas for fourteen hours. The temperature may vary from 50° to 70° F., but the air should be fairly dry. This dose was found to kill all adults and larvæ and some of the more mature pupæ. The eggs and many of the pupæ, however, escaped, and several fumigations at fourteen-day intervals are therefore highly desirable in order completely to eradicate the pest.

It was not found possible to exercise very effective control if the fumigation was carried out in a capacious glasshouse. Lepidopterous larvæ are extremely resistant to fumigants, and unless fumigation is done under the conditions indicated above, which ensure prolonged exposure to a fairly high concentration of the gas, the insects will be found to recover subsequently. Very few glasshouses are sufficiently gas-tight to permit of such a prolonged concentration, but fumigation with this substance as indicated above provides a 100 per cent. control for this pest, and incidentally will destroy all Thrips, which so often cause serious loss to those forcing azaleas.

CONTROL METHODS IN THE OPEN.

Tent fumigation of plants growing in the open is rarely resorted to in Great Britain, and is, in any case, a somewhat tricky and difficult operation, entailing high labour costs. For this reason it is suggested that outdoor attacks by this insect should be dealt with by careful and systematic applications of the lead-arsenate spray previously referred to. It is certain that the pest has now obtained a firm foothold in this country and that it can breed both under glass and in the open.

Furthermore, it can attack at least two species of Azalea, namely, *A. indica* and *A. Hexe*, and it seems highly desirable that serious attempts be made to check further spread, on a possibly widening range of host-plants.

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DAFFODIL CONFERENCE, 1926.

A CONFERENCE on Daffodils held at the Royal Horticultural Society's Hall on Wednesday, April 14, 1926, in connexion with the Daffodil Show, Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair.

In opening the proceedings the CHAIRMAN said: We hope that this informal Conference held to-day may be the first of a series of conferences, perhaps held annually, to give an opportunity to Daffodil growers and others to air their views and to get the best out of the scientific research that is going on by bringing it into a practical field. Unfortunately the scientific side seems always to be associated with a battle against disease, and, disagreeable as it is in this case, I hope some day we shall get further and that genetics may be brought in to add beauty to the healthy races of plants resulting from the discovery of successful methods of prevention of disease.

I am first going to call upon Mr. Chittenden to tell us the result of experiments on the eelworm disease.

MR. CHITTENDEN: I hardly know where to begin this short talk upon eelworm attack on Narcissi, for some, I find, know all about it, and some are still a little sceptical as to whether eelworms have anything at all to do with bulb diseases. It is rather strange that in these days there should be sceptics in that direction, but I think there still are.

I need not waste any time describing the disease. Experiments have left no doubt that the dark round ring that you come across in diseased bulbs of Narcissi in the autumn, sometimes near the base of the bulb, sometimes near its neck, is the result of the attack of a microscopic eelworm. They leave no doubt that the attack came from the soil, nor that it occurred through the invasion of the bases of foliage leaves by the eelworm. They leave no doubt that that invasion was followed by the gradual spread of the eelworm through the one leaf it had invaded into the base of that leaf which forms the ring in the bulb, and that is why you get the diseased ring. By and by that attack spreads right down to the base of the bulb, and from the bulb base, later on, into other scale-leaves in the bulb, so that, finally, the whole of the bulb is involved and the whole of the bulb rotted. Following that discovery, experiments were made, as you all know, to try to rid the bulb of eelworm. We know at what temperature the eelworm is killed, as the result of the experiments Mr. RAMSBOTTOM carried out, and we know at what temperature the bulb is killed, and the margin between the death-point of the eelworm and the death-point of the bulb is very small indeed. Those things are quite certain. The temperature for heating the bulb is 110° Fahr. The eelworm does not die till it is

exposed to 108° Fahr. It takes at least half an hour for the temperature in the middle of the bulb to reach the temperature of the water outside. The larger the bulb the longer is the time taken before the middle of the bulb reaches that temperature. You know there are pieces of apparatus on the market by which this heating can be done with a great deal of success, and you know that every piece of apparatus you take hold of and try to work has a man behind it, and unless that man is very careful about his job things go wrong, so that one cannot emphasise too much the care that is necessary in carrying out this warm-bath treatment.

These things we know, but there are many we do not know, and that is the reason of this Conference this morning. We do not know, for instance, exactly the right time for beginning warm baths. We do know that at certain times, i.e. at certain stages of the growth of the bulb, the warm bath is apt to do a certain amount of damage to the flowers and, perhaps, to the whole bulb. The result of the attack of eelworm upon the Narcissus, as far as growth is concerned, is to curb the growth of the leaf. Perhaps a little yellow streakiness is produced in it, perhaps a curve in the middle of the leaf or half-way up the stem. Those things, of course, a warm bath will not get over, and after treating bulbs partly attacked you will get next year those symptoms; in addition, you may get in bulbs perfectly healthy when you treated them—if you treated them at the wrong time—malformation of the flower and the splitting of the bulb. I believe that is solely due to giving the treatment at the wrong moment. I believe—I don't know—it is one of those things we should like expressions of opinion and especially observations upon—I believe the right time to do it is the time when the bulb is thoroughly dormant. There is a time when in most Narcissi, perhaps not in all, the old growth stops and the new development of the roots has not yet begun, when the base of the bulb is thoroughly dormant; but that time varies with different varieties. It may be it varies to some extent from season to season. I turned up an old copy of the JOURNAL containing a very interesting lot of photographs showing the growth of different varieties of Narcissi on certain dates, and showing how extraordinary was the difference between varieties in the amount of growth they had made. The JOURNAL I refer to is Vol. 28, and the date 1903, and the author of the paper was Mr. BARTHOLOMEW.

I fancy there are one or two varieties that never cease growth. I have never yet found a double *poeticus* without active roots. In most bulbs, however, you will find a time at which they are dormant, and I believe that is the right time to apply the treatment.

Another thing that we are not sure about is what plants are likely to be attacked by this eelworm. We are sure of one or two things. We are sure from the experiments of Mr. RAMSBOTTOM carried out and which have been repeated since, that onions are likely to be attacked by the Narcissus eelworm. I think Mr. RAMSBOTTOM also found that the Narcissus eelworm would attack the bulbs of the common Bluebell.

Besides that, he found no other plant liable to be attacked by this *Narcissus* eelworm. Now a very large number of our cultivated plants and some wild plants are liable to the attack of the stem eelworm, and it is impossible to see the slightest difference in shape or in life-history between most of the eelworms attacking these different plants. We believe, however, that certain races have attached themselves to certain plants, and they want no other food and will take no other food. It is quite possible, however, that they pass from one plant to another in certain circumstances that we are not aware of at present. Lately (although the thing has been known on a small scale for a very long time) the stem eelworm has been attacking the potato. Naturally, people have been rather worried about this particular attack, because if the potato eelworm can pass to the *Narcissus* there would be a great deal more trouble in making practicable rotations of crops. This is at present the only way we have of trying to get our soils free from the eelworm. So far as we can tell, it takes about four years to starve out the *Narcissus* eelworm. You must keep your soil free for four years of *Narcissus* bulbs and onions to be reasonably certain that there are no *Narcissus* eelworms left; but if potatoes are going to be a crop liable to attack you will have to keep the potato off too.

There is another danger: we have no direct proof, but we have some fear that it occurs. With the moving of potatoes off land that has been affected with *Narcissus* eelworm, the *Narcissus* eelworm may be taken with them. It is a most unusual thing to find seed potatoes, as sold, come to you as seed potatoes alone, for they nearly always take a little earth with them, and I fear that in that earth may be carried some living eelworms, and that may affect land intended to be planted with *Narcissus* afterwards.

I hope what I have said will arouse some criticism and induce some to give us their observations and knowledge and make the Conference worth while. (Applause.)

Mr. G. FOX WILSON then dealt with the *Narcissus* eelworm and its relationship to other plants, particularly potatoes. He said:

Of increasing concern to bulb-growers is the knowledge that the stem eelworm, *Tylenchus dipsaci*, more generally known as *Tylenchus devastatrix*, has become within the last fifteen years a serious pest of potatoes, especially in the eastern counties of England and in Scotland, and the question arises as to what bearing the potato strain or race of eelworm has on *Narcissus*, and the reverse.

There are at least two species of eelworms which attack potatoes: (1) the beet eelworm, *Heterodera Schachtii*, which forms small nodules on the roots and rootlets, and (2) the stem eelworm, *Tylenchus dipsaci*, to which my remarks will be confined, for *Heterodera* does not attack *Narcissi*.

It may be advisable at this stage to describe the general symptoms of eelworm attack on potatoes, and later to consider the possibility of cross-infection from *Narcissus* to potato, and vice versa.

The foliage and stems of potato-plants infected with eelworms generally show no sign of disease, and, owing to this, the disease is often overlooked. The attacked tubers show characteristic cracking of the skin, giving them a wrinkled appearance. On cutting through the tuber we see an internal rotting which penetrates into the tuber for a greater or less distance from the epidermis, and it is in this rotten tissue that we find large numbers of parasitic eelworms, and in the outer disintegrated portions are to be found large numbers of saprophytic species. In the present state of our knowledge we are unable to state whether certain varieties of potatoes are more susceptible to attack than others, or whether it is an established fact that first-earlies are less susceptible to attack than second-earlies and main-crop potatoes. Attacked tubers should not be stored, for they rot in the clamps and pits. The potato race, like the Narcissus race of eelworm, is a primary pest, and is capable of attacking healthy tubers directly from the soil and not by way of the stem.

Experiments were commenced at Wisley last October to ascertain whether eelworms taken from diseased Narcissus bulbs will attack potatoes, and whether eelworms taken from diseased potatoes will attack Narcissi. Inoculations have been made with the respective races in different parts of the plants, i.e. in the foliage, stems, and tubers of potatoes, using the Narcissus strain, and in the foliage, flower-stems, and bulbs of Narcissi, using the potato strain. As far as we know, and it is important to lay stress on the present incompleteness of our experiments, there is no indication that cross-infection takes place in either case. There may be, however, a danger when potato "seed" is obtained from land in which infected Narcissi have been grown within the previous three years. The reason for making this statement is that we received last January some tubers infected with eelworm from Lincolnshire, and, on examination, it was found that adhering to the tubers were small pieces of dried soil in which were found eelworms in a desiccated condition, which, however, proved to be the potato race. It is logical to suppose that the Narcissus strain could be carried similarly on "seed" potatoes which had been growing in land infected with Narcissus eelworm, and thereby introduced into land that had not been infected hitherto with this particular race. This provides another example of the passive migration of these important plant-pests.

To review briefly our present knowledge in the matter of host susceptibility to the Narcissus race of eelworm, we turn to the work of the late Mr. J. K. RAMSBOTTOM, who carried out extensive field trials in Lincolnshire and pot and plot experiments at Wisley, using thirteen crops susceptible to the stem eelworm. He found that only two plants were attractive to the Narcissus strain—these were onion and *Scilla nutans*, whilst potatoes were amongst those which were not infected. Similarly, Dr. SLOGTEREN, working in Holland with infected Hyacinths and Narcissi, was unable to infect Hyacinths with the Narcissus strain, and vice versa.

As many as eighty different species of plants belonging to various

natural orders are recorded as hosts of the stem eelworm, and yet we find a specific preference shown by this eelworm for particular host-plants. This dependency on certain plants or specialized parasitism was recorded by Professor RITZEMA BOS many years ago, when he put forward his theory of biological strains. Morphologically, there is no difference between the several races, and yet each has become so adapted to its particular host and so conservative in its actions that one race will not readily attack (if it does at all) other plants which themselves are hosts of other races of *Tylenchus dipsaci*. The so-called resistance of plants to eelworm attack should be more correctly termed unattractiveness, for resistance suggests that either mechanical or chemical means are used to withstand attack, and so far as our present knowledge goes we are unable to say that plants withstand attack by these means.

The most attractive plant to the Narcissus race, apart from Narcissi, is the onion, and it has been shown at Wisley and elsewhere that an interval of at least three years should elapse between the taking off a crop of diseased Narcissi and the sowing of onions.

A danger of growing perennial plants year after year in infected ground is the possibility that a particular race of eelworm might adapt itself to its new host.

Careful records should be kept as to the crop-history of land. This applies to market and private gardeners as well as to farmers, and when attention is paid to the scientific rotation of crops there will not be any chance of disaster by following with a susceptible crop on land infected with a particular race of eelworm. Being armed with the following data: (1) the crop-history of the land, and (2) a knowledge as to what plants are attractive to certain races of eelworms, one may even grow crops susceptible to stem eelworms on infected land, provided that these plants are not attractive to the particular race present in the soil. By that is meant that if a field is known to be infected with the Narcissus race of eelworm it is fatal to attempt to follow on with onions, for they will fall victims to this race; but it would be safe to plant the ground with potatoes. This will hold good only when the land in question has not contained infected potatoes within the last three years. A field may possess in its soil-population several races of eelworms, e.g., the Narcissus, potato, and Phlox races, all of which, as far as we know at present, are incapable of infecting one another's host-plants.

In lifting a diseased crop it is essential that the ground is thoroughly cleared, so that the particular race of eelworm is not "carried over" from one year to another on stray or "volunteer" plants.

To summarize quite briefly our present knowledge of potato eelworm in regard to Narcissus cultivation: (1) It appears that potatoes may be grown with impunity on land that has carried a crop of diseased Narcissi; (2) It is unwise to procure potato "seed" from land which is infected with Narcissus eelworm by reason of the possibility that the pest may be carried in soil adhering to the tubers.

Mr. R. O. BACKHOUSE: With some of the Dutch bulbs of Hyacinths you get one or two years' flowers and then they are practically wiped out. I should like to know whether the land on which diseased Hyacinths were planted would be dangerous for Narcissi.

Mr. FOX WILSON: Extensive experiments have been carried out in Holland and small experiments at Wisley, where it has been found that Hyacinths can be grown safely with Narcissi, or the other way round.

Mr. W. B. CRANFIELD: I should like to supplement what Mr. Chittenden has said, and I am sure he will forgive me if I differ from him on one or two points. Unfortunately I left my notebook at home this morning, so I shall have to speak more or less from memory. The first point Mr. Chittenden made concerned temperature. He stated that the proper temperature for hot-water apparatus is 110° , and that 112° proved fatal to bulbs. * Well, that does not quite accord with my experience, for I invariably employ a temperature of 112° by which to destroy Tylenchus and its eggs. On one occasion, when I was treating a number of bulbs, they were put into the bath at 12 o'clock and forgotten until 3.30, when the temperature was found to be 125° . How long it had been 125° I don't know, but I turned out the container and the bulbs of various sizes, among them 'Empress' and 'Florence Pearson.' I found these were badly affected, and were pulped. Of those less affected we could cut out the diseased part. When the bulbs were cooled off they were dried in the ordinary way, and I thought "What shall I do with these?" I expected they would all be killed. They were all planted. A number were planted in the open. The remaining plants were planted in a frame. One treasures one's white Trumpet crosses rather, and they were in frames the first year. Those bulbs are all in full flower at the present time.

So much for temperature. I would not recommend anyone to treat their bulbs at 125° , but that is my experience. How long it had been 115° to 120° and got to 125° I can't say, because I was asleep.

The next question is as to the time to treat the bulbs. One usually treats them in the resting period in the autumn, but it would be interesting to learn whether it would be possible to treat bulbs during their period of growth. I have done so, but, unfortunately, the bulbs have not done very much good after it. When you have a valuable bulb suffering from eelworm, if you leave it till autumn probably the bulb has disappeared altogether, and you apply the remedy too late. It would be interesting to know whether, in treating them during their period of growth, there is any possibility of their recovering. I may mention that Mr. RAMSBOTTOM used to come down to my place to examine bulbs which were under treatment

in various ways, but there was no process that we could suggest or that was ever suggested to me that was ever so efficacious as the heating. Then as regards the various plants the *Tylenchus* will attack. Mr. RAMSBOTTOM and myself tried examining a variety of weeds and plants which were growing in the beds where the Daffodils were being grown, and we found what was, apparently, a similar *Tylenchus*, not only attacking the Daffodil, but attacking *Muscari*, in plantain, grass, and other things. Under a microscope no difference could be seen between the particular nematode which attacks Daffodils and that which was feeding on the plantains and *Muscari*. I don't know whether it is the same *Tylenchus* that attacks *Gladioli*, but under the microscope I could tell no difference between that particular eelworm and that which was in the Daffodils (see p. 61).

Mr. COBLEY : You can go with safety to 112°. I would not like to dare to say you could go for three hours. After eight or nine years' experience I find that, so far as possible, you must be quite certain that the bulb is in its resting period. One thing has not been mentioned and that is the extreme danger of doing your sterilizing too late. If you do it after the resting period, you do yourself really serious damage. With regard to soil : We had a very serious infection which wiped out a crop of Golden Spur, followed by oats and potatoes ; none of these latter were affected and we were quite free from eelworm, and we were able to plant *Narcissi* back. I think you can sterilize without fear of losing a flower. The last point is the danger to young seed-potatoes in which *Tylenchus* is prevalent. In other districts one has also to bear Tulips in mind. I have heard of one case of mysterious infection which was subsequently followed by *Narcissi* and ended seriously.

Mr. LEAK : I wish to make a few remarks as to the time of sterilization, because it seems to trouble amateurs in particular, and, perhaps, growers as well. I think it should be taken as a safe plan, if the bulbs are infected, to try to check the disease more quickly by lifting early. We have tried it for three or four years and find it work very well. If we have some new varieties we lift them early, but do not sterilize them immediately. We find it better to let the roots dry and then sterilize. The result is you don't destroy the bulb or plant the following year. On the other hand, if you want to sterilize and secure a decent flower for the following year, the thing is to let the bulbs mature in the ground, die down, and then sterilize. The question of *Tylenchus* in *Gladioli* : I do not think there is any need to be afraid of any *Narcissus Tylenchus* affecting *Gladioli*, or vice versa. We have only had one bad loss of *Gladioli* by *Tylenchus*, and that was not after the bulb crop, but after a crop of *Phlox*. We have planted *Gladioli* after a very bad attack of *Tylenchus* in *Narcissus* and had a very successful crop of *Gladioli*, so that I do not think there is any chance of infection between the two.

Mr. EXLEY: I am surprised that none of the speakers has mentioned the soil but only the bulb. The eelworm is on the moist soil. In dry soil it dies out immediately.

Mr. H. BACKHOUSE: Our soil was very light, and it was absolutely dried; but they thrive in and remain alive for as long as three years in a desiccated spot.

Mr. P. D. WILLIAMS: We had a similar conference the other day at Penzance, and reference was made there to sterilizing. It was said that with a larger bulb it was not at all certain that you killed the last egg of the eelworm with one course of sterilization at 110° in three hours. Perhaps someone here might have some experience in it. It struck me as a somewhat important thing, and it would be useful if we could make this sterilization more efficient.

Mr. LEAK: I should like to say a word about that. It is a very difficult matter to determine, but I think the fear of eggs not being destroyed and hatching out afterwards is one that need not seriously trouble us. You may sterilize 10 acres of Daffodils, and they will be perfectly healthy, with the exception, perhaps, of a little gap of disease. I think if the eggs were not killed you would get the disease more or less all over the field. I think the infection comes from the soil and not from any egg left in the bulb. It is a matter of personal opinion, of course.

Mr. WILLIAMS: The size of the bulb would probably have some bearing on it.

Mr. LEAK: I mean to say, if you give the full three hours to any bulb, however big it may be, I think you will kill the disease.

Mr. W. POUPART: My son was anxious about a quantity of bulbs he had. He heated them for three hours two days in succession, and they are growing perfectly well.

The CHAIRMAN: It does them no harm, then?

Mr. COBLEY: I don't think you would get 100 per cent. killed. You can have a crop carefully sterilized, planted for three years, and in three years you will find the eelworm here and there. You may treat the bulbs with the utmost care, but I don't think you can entirely kill the disease. In all soils you have small quantities.

Mr. CHITTENDEN: I have very little to reply to. I agree you can raise bulbs up to astonishing temperatures. I heard of Mr. Dorrien Smith having a bulb at a temperature of 130° for a short time, but whenever I am asked to give advice on these matters I think of a tale given as a composition exercise at school. A man advertised

for a coachman. When the applicants came to him he asked them all the same question, "How near to the edge of a precipice can you drive?" One said he could go within six inches and another that he could go within one inch, and yet another said one foot. At last one came along and said "I should keep as far away from it as possible." He got the job. Do that with temperature. I am perfectly certain that four hours with a temperature of 112° will damage the bulb badly.

The CHAIRMAN: That is the point of difference between Mr. Chittenden and Mr. Cranfield.

Mr. CHITTENDEN: Talking of temperature, may I make one other remark? You ought to be extremely careful about your thermometers. Unless they are properly tested from time to time the reading they give may be misleading.

Mr. CRANFIELD: I ask whether you have lifted bulbs in full growth and treated them? I ask because if you have a seedling attacked by eelworm you want to save its life if possible.

Mr. CHITTENDEN: I should have no hesitation in heating a bulb in full growth for two hours if it were likely to die of eelworm attack.

Mr. CRANFIELD: Thank you, sir; I will do some to-morrow.

Mr. CHITTENDEN: I said I should have no hesitancy if I must do it, but, as Mr. Leak said, it would be far better to let them dry off. If it were in a very serious state, then I should have no hesitation.

The Chairman then called upon Mr. Fryer to deal with Narcissus Flies.

Mr. FRYER said: It is, I imagine, the duty of the opener of a discussion to deal as briefly as possible with the salient points of his subject, and to leave it to subsequent speakers to develop any special aspects in which they may be interested. I therefore propose to introduce my subject, that of Narcissus Flies, by giving a brief summary of what is known about the habits of these flies, and of the conclusions we can draw as to possible methods of destroying them or of preventing the damage which they cause.

There are three species of flies concerned—first, the Large Narcissus Fly, *Merodon equestris*, and, secondly, two species of Small Narcissus Fly, *Eumerus strigatus* and *tuberculatus*. It will save words if in talking about these flies I refer to the Large Narcissus Fly as *Merodon* and the Small Narcissus Flies as *Eumerus*; and since the difference, if any, in habits between the two species of the latter genus are still unknown, I shall lump them together and treat them as if they were one.

Merodon was first recorded in Britain in 1869, but was possibly known as early as 1851. As regards *Eumerus*, Theobald believes he found it damaging Narcissus bulbs in 1885, but the early history is

uncertain. I don't propose to discuss whether the species are native or introduced, as the subject is now chiefly of academic interest, and however this may be, both *Merodon* and *Eumerus* are now very widely spread.

As regards food-plants, *Merodon* is recorded from *Narcissus*, *Hyacinth*, *Habranthus*, *Vallota*, *Galtonia*, *Scilla*, *Leucojum*, and from *Tulip*; but in most of these plants attacks are very rare, and for practical purposes we can confine our attention to the *Narcissus*. As regards *Eumerus*, *Narcissus* again is the plant most often attacked, but the grubs have been found in rotting *Iris* rhizomes, parsnip roots, potato, and onion, and the insects evidently have very general tastes.

Now, having cleared the ground somewhat, we can turn to the habits of the flies in question.

If during the month of May—in my experience in the extreme end of the month—we go where Daffodils are extensively grown, we shall find the adults of both *Merodon* and *Eumerus* flying about the beds and settling on the soil, or sometimes on the ripening foliage. *Eumerus* is particularly fond of basking on the paths in the hot sun. Neither species in my experience visits either flowers or any other attraction, but the experience of others may differ. At this time both kinds of flies are laying their eggs.

If a ripening Daffodil-plant be examined it will be noticed that as the foliage dries and shrivels a narrow channel through the soil down to the bulb is left. The female *Merodon* when ready to lay her eggs crawls round about this hole, and, if satisfied, she backs down it and lays an egg either on the sides of the hole or on the foliage. If the hole is not satisfactory she may choose a position under a lump of earth lying close by.

The female *Eumerus*, being so much smaller, is able to crawl right down the hole previously referred to, and so reach the neck of the bulb or even the bulb itself. There she lays a batch of eggs—about thirty to forty—as near the bulb as she can get; but I have an idea that she prefers to be close to the spot where the foliage ultimately breaks away, for at this point there is not infrequently a temporary moist decay of the old foliage, which I believe enables the young grubs to begin their attack. *Eumerus*, however, is also quite prepared to lay her eggs on bulbs left lying on the ground in the open, but I have not yet found them in the soil. In the case of *Merodon* there are only one or two eggs laid near each bulb, while in *Eumerus* there are a number. The eggs in each case hatch very rapidly, like those of many flies. I have had *Merodon* eggs hatch within three days of laying. At this point our knowledge of the habits of the two species is rather deficient. I believe that in the case of *Merodon* the larva works its way to the base of the bulb and then burrows into the basal ring or plate, making a semi-circular channel round the ring for the early part of its existence. I have found very young larvæ in this position, and also it is well known that damage to the basal ring or plate is characteristic of a *Merodon*-attacked bulb. After a short time, i.e. by the month of

August, the larvæ have worked their way up into the bulb scales, where they feed for the remainder of their existence, eating out the centre of the bulb and often completing their existence in the neck. Merodon larvæ become full-fed over a long period—mostly in the course of the autumn—and pupation takes place, usually in the soil, but sometimes in the bulb, from any time from late autumn to spring—more often, I think, the latter. So far as I know, Merodon only occupies one year in a complete life-cycle, but it has been suggested that larvæ sometimes feed on through a second summer before pupating.

Now as to Eumerus—the larvæ hatching from the egg-mass appear to work their way into the bulb between the leaf-bases and the neck, and according to the size of the bulb and number of larvæ they may all remain in the neck or completely hollow out the bulb. The larvæ feed rapidly and pupate sometimes in the bulb, but, as the latter usually breaks down and becomes a squashy mass, many of them often work their way into the soil by the side of the bulbs. Towards the end of summer larvæ of many different ages and puparia may all be found together, and from this point the habits of the insect are rather mysterious. Many of the puparia produce flies during the early autumn. Such flies seem to die without laying any eggs. They do not appear to lay eggs on bulbs in store, while in the open no trace of the Daffodils is left to guide the female in oviposition. These autumn flies therefore appear to do nothing, and, so far as the species is concerned, to be wasted. The larvæ, however, which have grown more slowly continue to feed on throughout the end of summer and autumn and pupate over a long period. By early spring they have mostly pupated and flies emerge—in my experience—during May.

So much for a brief and condensed life-history of the flies in question.

Next as to methods of controlling the pests.

First, where the bulbs are lifted and can be submitted to the hot-water treatment, the larvæ of all species can be killed while still in the bulbs, and an hour's treatment at a temperature of 110° F. is sufficient. Mr. J. W. BARR and I, in some experiments made shortly before the war, never failed to kill the larvæ by this method. But this is not satisfactory, first, because we may not wish to subject our bulbs to the treatment, and secondly, because it is seldom possible to lift a large number of bulbs at once. With a view to meeting the first objection, my colleague, Mr. STANTON, has in progress some experiments on fumigating the bulbs with paradichlorobenzene, which offer some prospects of success. The second difficulty is, however, much more serious, and clearly we have to find some means of (a) destroying the adult flies, (b) hindering them from egg-laying, (c) destroying the eggs when laid.

As regards (a), some have claimed success by catching adult flies with a butterfly-net, but this method is not of general use, and, as there appears to be no other method of catching the flies, this line does not seem hopeful.

(b) As regards hindering the flies from egg-laying, you will notice how very convenient for them is the channel left down to the bulb. It seems worth testing the effect of earthing up the rows of bulbs as soon as the leaves begin to turn colour. I have also tried chemical deterrents, such as naphthalene, but the results are inconclusive, and trials should be repeated.

(c) As regards destroying the eggs, those of *Eumerus* are pretty well out of reach if the fly is allowed to go down the hole to the bulb. Those of *Merodon*, however, are fairly exposed, and I am wondering whether the treatment now in universal service against Cabbage-root Fly would not prove successful. This treatment consists in watering the soil round the stems of the cabbages with a very weak solution of corrosive sublimate (1 ounce of corrosive sublimate in 10 gallons of water). Probably three waterings would be required at ten days' interval, beginning when the flies were first seen about in numbers. Corrosive sublimate (mercury bichloride) is, of course, a dangerous poison, but at the dilution mentioned above it is less than the strength used for surgical dressings and with proper care no danger should arise. As regards my suggestions as to a method of control, therefore, I believe it would be worth while to test both earthing-up and corrosive sublimate, or preferably both simultaneously, *i.e.* earth-up the plants when the foliage turns colour, then water the rows three times at intervals of a week or ten days with the corrosive solution.

Finally, I may refer to one point which some years ago was a source of controversy—is *Eumerus* a parasite or a scavenger? At first I believed it was mainly parasitic, now I believe that it is both, and I am inclined to think it prefers a decayed bulb to a sound one. Nevertheless, I have met with so many cases in which *Eumerus* larvæ were the only source of trouble that I am convinced that the species can and does attack sound bulbs—especially in soils and seasons which result in a rather wet decay of the foliage, where it drops from the bulbs.

I hope these brief notes may serve to arouse other speakers to give their experiences with Narcissus Flies. It is twelve years since I personally paid them special attention, and little appears to have been published in the interval; but I feel sure that the many Daffodil-growers in this country must have made many observations upon the pests, and that there must be much of value which should be placed on record for the benefit of all concerned.

Mr. HODSON: As to the breeding habits of the fly: Towards the latter end of August last year I was in the Isles of Scilly, and saw the fly feeding on fennel. It struck me at the time one might, perhaps, use some bait. I have also seen them feeding on dandelions early in the year. I cannot say more about the habits of the fly. There is one other point. At Marazion certain growers scuffled the ground of infected parts, but no experimental evidence has been taken. I think the thing should be done after the foliage has gone off. We have got

some experiments laid down for this year dealing with the matter of preventing egg-laying.

Mr. LEAK : I take it, it refers more to Eumerus than to Merodon ?

Mr. HODSON : Yes. As regards Merodon, early appearances occurred in February and March or both. Probably these were hatched out from bulbs grown under glass.

The CHAIRMAN : I have heard of the empty cases being found already this year.

Mr. WILLIAMS : I would like to confirm what the first speaker said about the Merodon entering the base of the bulb. It is quite certain that in many instances the Merodon feeds on the base of the bulb, just inside. I am quite certain—I don't think in every one—the majority do go in at the base. There is a question of control measures. I wonder if anyone has ever tried sprinkling naphthalene crystals over the soil ? I think it is possible it might be useful.

Mr. BARR : We have tried it, but the results were not satisfactory.

Mr. WILLIAMS : There is one other point. I always think you see Eumerus more often in the bulb which is otherwise in a damaged state. It seems to me to get into the bulb that has had previous damage done to it.

Mr. CRANFIELD : With regard to control measures for the Merodon and Eumerus, we are trying this year what everyone has heard of—tree-banding. We are putting down between the rows of our choice bulbs strips of paper with cross-banding, in the hope that they may attract the female flies when going to lay their eggs. Whether it will be successful or not I don't know. There is another method of dealing with the large fly, which we have found very successful in dealing with queen wasps. The difficulty of getting the fly into a butterfly-net is very great. If you take an ordinary automatic pistol, an American pistol, with cartridges filled with dust-shot, you can shoot them easily (Laughter), and it is a most sporting way of doing it. Any intelligent boy can do it. You can usually approach within a few feet of them. The effective range of this automatic pistol is about four feet. I have killed, or rather, my son did, 180 queen wasps on Cotoneasters. They took no notice of the discharge. I commend this as a sporting method.

The CHAIRMAN : What happened to the Cotoneaster ?

Mr. CRANFIELD : It did no harm to the plant. We have soaked to get rid of the large fly. We have soaked bulbs in cold water, and in the tub in which we have submerged them we have found any amount of the pests come out in cold water after being there some hours.

Whether you get rid of them all I don't know, but you do get rid of a good many.

Mr. EXLEY: I have usually used a racquet for the purpose. Another suggestion is to spread the soil over your more choice bulbs.

Mr. LEAK: I would like to say a word in favour of the net. Mr. Cranfield says it is very difficult to get them with the net. When we had some beds of seedlings, and did not want to lift them just at the time to sterilize them, we gave boys one penny for twenty, and in an hour they caught some 200, and that was a good way of getting rid of them.

Mr. R. O. BACKHOUSE: The flies settle on the soil and run backwards an inch or two, and lay their eggs on the base. I have tried this method to prevent damage. When I have had one or two extra-good varieties, which must not be lost, I have wrapped a little cotton-wool round the base of the stalk. Flies are very shy of settling on fabrics, and would probably go to the less choice varieties.

Mr. FRYER: I am afraid the time is getting a little short, or I should have dealt with some experiments with paradichlorbenzene by my colleague, Mr. STANTON. He found it was perfectly satisfactory in destroying bulb aphis, and where the larvæ were more or less exposed it also destroyed the Merodon, and that it will destroy the Merodon in the average bulb. I am hoping this time next year to find that, if you don't want to treat your bulbs in hot water, you can kill Merodon equally well with paradichlorbenzene in forty-eight hours.

The Chairman then called upon Mr. Dowson, who dealt with "Sclerotial Disease of Narcissus due to *Botrytis* sp." He said: In this country this disease is only known, so far, on imported bulbs which, when planted, never grow. The symptoms of attack on growing plants are not known, but there may be a partial development of leaves similar to the feeble growth of Tulips suffering from the fire disease—*Botrytis Tulipae*.

The scales of the bulbs which do not grow are covered with rounded flat sclerotia, black in colour, and measuring to $\frac{1}{8}$ inch across, i.e. much larger than those of *B. Tulipae*. In some of the diseased bulbs larger sclerotia occur within the scales.

Inoculations of mycelium into dormant bulbs have, so far, produced no effect; but when the flowering stems are inoculated infection follows in every instance. The symptoms are as follows:

- (1) The inoculated parts change colour from green to a yellowish brown, then become soft and rotten.
- (2) The leaves fall over, dry up and wither.
- (3) Sclerotia and *Botrytis* fructifications appear on the inoculated places if kept moist. The results on the bulbs have yet to be ascertained.

The conidia of this *Botrytis* measure $11-13 \times 6-9\mu$, and are grey in colour.

The only other host-plant infected by this fungus is the Snowdrop, 50 per cent. of which contracted the disease as the result of inoculation. Both out of doors and under glass the effect on the Snowdrop is not like that described by Cooke—"Fungoid Pests of Cultivated Plants," 1904, p. 71—Snowdrop White Mould caused by *Botrytis galanthina* B. and Br. This is said to be worse in the North, but the conidia are hyaline and rather larger:— $15-18 \times 10-11\mu$. The bulb is attacked, and also the growing point; a delicate white mould covers the leaves, etc. Black sclerotia are formed later, which correspond in size with those of the *Narcissus Botrytis*. See *Gard. Chron.* 75, p. 160, 1924.

The Conference then adjourned.

On resuming proceedings in the afternoon, the CHAIRMAN said: I should like Mr. LEAK on our behalf to convey our thanks to the Council for making it possible for us to hold this Conference. We are very thankful to the Council for the help that has been given to us. (Applause.) This morning we devoted to the pests and abominable nuisances. We are hoping this afternoon to look at the beauties and charms of the Daffodil and see how far we could develop them for our use. Mr. ENGLEHEART could have told us something about that and given us some idea of improving the Daffodil. I should like to read a letter which I have received from him. He writes:

THE CHAIRMAN.

MY DEAR BOWLES,

You will remember that I had to guard myself against any definite promise to discourse on daffodils at the forthcoming April Show. Well, here I am pegged down in bed, where I am scribbling this, and am likely to remain so another two or three weeks,—a "half-timer" at best, allowed up now and again only for an hour or two and then ordered back. So London is as remote as Patagonia.

I'm afraid the cut-and-dried florist sect of Daffodilists care little for your views or mine on form and colour, but will advance serenely to their ultimate perfection of a yellow saucepan lid with a scarlet middle (laughter), or at all events to the front view of every flower and the side view.

Have you observed that that splendid piece of pure gold, 'Maximus,' noble in all ways when well grown, has practically been dropped altogether because of its "poor," i.e. not flat-board perianth—the twist in the said perianth being its distinctive beauty? I raised some fine seedlings from it on its own lines, but the trade would have none of them because of the perpetuated twist.

Yours sincerely,

GEORGE ENGLEHEART.

Mr. GUY L. WILSON said: I have been asked to talk about "Daffodils for the Garden." I take it that that means the most suitable Daffodils for growing in garden borders and beds for effect, or in a patch of the kitchen-garden for cutting. It will be well to consider the qualities most desirable in varieties for this purpose. Vigour of constitution in the first place is essential: to this must be added freedom of bloom, adequate length and strength of stem, substance and lasting quality in the bloom, and, of course, it goes without saying, we want a beautiful flower and plant; and let the flower be pure and clear in colour, and of a colour that is not

damaged by exposure to sunshine—this last proviso cuts out almost all red and orange crowned varieties known up to date, as almost without exception the red colouring burns rapidly in sunshine, and the flowers assume a shabby appearance in consequence. We also want early and late varieties, to extend the season of bloom as much as possible.

As most of us here have served our apprenticeship in Daffodil-growing, I need not go into cultural details; but I think it well to mention one fact that impresses itself more and more strongly upon me year by year, and that is that it may take a Daffodil that one imports into one's garden from some other part of the British Isles, and more especially, I think, from Holland, anything up to five years to get really acclimatized and do its best. I have frequently found—indeed, it is the general rule—that when I plant new bulbs from elsewhere they do only fairly for several seasons, and then much better. The very finest bulbs I handle come to me from a climate and soil very different from mine and, as a rule, give splendid bloom the first season, and then do only fairly or indifferently for a couple or perhaps three seasons, after which they are all that could be desired. Bearing this in mind, it is well not to scrap too hastily varieties that do not fulfil expectations at first.

It will scarcely be the object of this Conference to discuss the garden merits of old and well-known kinds, so I shall talk about what seem to me likely to make good garden-plants in the future.

Beginning with Yellows, which are of the utmost value for brightening up the garden in early spring—good yellow Trumpets of reliable constitution are difficult to find—'King Alfred' fulfils all ideals in the matter of good looks, beautiful colour, and lasting quality, but in many places it will not grow, and so must be counted out—we have long looked for a flower of 'King Alfred' type that will grow. I think this ideal has at all events been approached in 'Golden Emperor,' raised and sent out by Messrs. J. R. PEARSON & SONS, who describe it as a very vigorous doer which thrives where 'King Alfred' fails. It is a fine flower of 'King Alfred' type and colour. I had a bulb four seasons ago, which grew in perfect health, increasing well, but failed to give really good flower till this season, when it seems to be acclimatized.

Early yellows of 'Maximus' colour and sufficient vigour of constitution are wanted. I think it probable that a useful line would be derived by using 'Santa Maria' as a parent. I have had some 'Santa Maria' crosses myself, vigorous and very free-blooming plants, very early, tall, and graceful, deep-golden flowers of the decorative rather than the show type. A good example of this type is a flower called 'The Perfect Gentleman,' raised by the late C. L. ADAMS of Wolverhampton. This, I believe, was a seedling from 'Goldseeker,' which was probably a self-fertilized 'Santa Maria' seedling. The stock is still very small, but it seems a good doer, and the colour is very fine. Many fine, handsome, robust-looking large yellow Trumpets are now to be seen amongst the newer flowers of our shows. Doubtless only small

stocks exist of most of them, but it is probable that amongst them some reliable doers may be found. 'Bulwark' is one of such, and will appeal to those who like a big and bold flower. I think it probable that a race of very fine yellow garden Daffodils may be evolved by inter-crossing the best yellow 'Giant Incomparabilis' with yellow 'Ajax,' and I fancy that Mr. P. D. WILLIAMS has some magnificent things in this line in store for us. There are, no doubt, excellent garden-plants amongst the newer yellow 'Giant Incomparabilis' themselves, for example 'Solleret,' and 'Pilgrimage,' and 'Jubilant,' vigorous free-blooming varieties bearing large well-coloured flowers of fine form. 'Solleret,' which is said to have a trace of Jonquil blood, is a particularly fine plant. Up to date we have not seen many Jonquil hybrids, but these seem a promising line for garden-work. 'Buttercup,' no longer new, is a free-blooming and increasing plant of splendid constitution, bearing shapely rich self-coloured flowers that open late and help to maintain the supply of yellow flowers in the latter part of the season. Before leaving yellows, I should like to mention 'Orange Glory,' which is, I believe, a secondary cross from Cyclamineus, and promises all the grace and charm of Cyclamineus hybrids without their usually weak constitution. This variety is vigorous, increasing rapidly and blooming freely. It is, of course, a comparatively dwarf plant, but therein lies part of its charm: its trumpet is a very pleasing orange-gold colour which does not fade.

Coming to Whites, several excellent garden-plants have recently appeared amongst white Trumpets. First and chief I should place 'Beersheba,' which has been honoured by Awards of Merit and First Class Certificates from the R.H.S. Narcissus Committee and the Midland Daffodil Society. Indeed, I should almost call it an ideal Daffodil for any purpose: it is a first-class show flower of fine size, perfectly beautiful form and quality. It is an early flower, and possesses such durability of texture that it lasts throughout the major part of the season. It is a plant of great vigour, *very* free-flowering, and increasing rapidly. Its stems are of good length, and strong enough to withstand heavy wind, and the outstanding purity of its whiteness makes it very conspicuous amongst others. 'Trappist,' raised by THE BRODIE OF BRODIE, is an ideal garden-plant, tall, vigorous, very free-blooming, and having very beautiful blue-green foliage. It is a good-sized flower of very lasting substance and decorative outline; on first opening, the trumpet is very pale clear lemon, the whole flower soon passing to dead white. 'Eskimo,' another flower from the same raiser, is on the border-line between 'White Ajax' and 'Leedsii,' and is also an excellent garden variety. It is rather late, opens with primrose crown, but soon passes to brilliant white in the sunshine. It is a most prolific bloomer; the flowers are of fine substance and stand well above the foliage, producing a telling effect.

There are great possibilities in the 'Leedsii' section, and many splendid garden-plants of the utmost vigour are to be found amongst them. Of more moderate-priced ones, 'Irish Pearl,' which I raised

a number of years ago, is an excellent plant, growing, as it does, with the utmost vigour and producing a lavish supply of beautiful flowers.

Amongst newer ones, 'Tenedos,' raised by Mr. ENGLEHEART, is the finest yet in the market, a beautiful flower of giant proportions, usually fully five inches across, with stem, foliage, and constitution to match. The crown is primrose on first opening, but soon the flower passes to pure white: its lily-like dimensions make it very striking in the garden. 'Hymettus,' raised by THE BRODIE OF BRODIE, is a distinct flower of quite exceptional attractiveness as a growing plant; of large size and fine substance, with spreading white perianth and a very charming crown, whose well-frilled brim is somewhat flanged and edged with clear lemon, the flowers are borne on tall, stout stems, and, like those of 'Tenedos,' improve with exposure. 'Mitylene' and 'White Sentinel' are two very beautiful flowers of shallower-crowned type, large, circular, beautifully proportioned, and of fine quality; borne on tall stems and abundant in bloom, they are first-class and most effective border plants.

The bicolor Trumpets have, perhaps, been rather neglected, though, no doubt, some good things in this line are coming along. Of newer ones on the market, possibly 'Moira O'Neill' is the finest garden-plant, a very beautiful flower of good quality and size. The cool clear lemon of its trumpet in conjunction with the broad white perianth gives a most charming effect in the mass. It is very tall, vigorous; and free-flowering.

No one, of course, will want to exclude all the varieties with highly coloured crowns from their garden, if only on account of their brilliance and beauty as cut flowers. Of these probably the best garden-plants known to me are 'Firetail' and 'Sunstar,' the latter a variety raised by the late Mrs. R. O. BACKHOUSE and sent out by the Donard Nursery Co. A bed of 'Firetail' newly open is a beautiful sight. It increases and blooms with most lavish freedom, and its very long stem enhances its value for cutting. It will amply repay planting in a partially shaded position. 'Sunstar' is a very fine flower of the 'Barri' type, with broad, substantial ivory perianth, and an eye of dark and densely solid red that is conspicuous from a distance. It is a very strong plant. Some time must elapse before 'Fortune' can be considered as a border plant, but it is a fine vigorous doer as well as being a flower of superlative splendour, and it blooms so early that its colour is better retained than that of some that open later when the sun is stronger.

Nearly all the Poets must be cut young to preserve their beauty, but 'Dactyl,' one of the newest, and perhaps the finest, is a flower to leave in the garden, as it attains its best development only when left on the plant. It is large and exceptionally tall, and is a flower of superb form and quality, and quite wonderful lasting substance.

If someone can evolve a strain of flowers having red or orange crowns that are *really sunproof*, an immensely valuable addition will

be made to our garden Daffodils. But, personally, I am most impressed by the vigour, beauty, and value for the garden of the newer whites in the 'Leedsii' and 'White Trumpet' sections; the more sunshine they get the more splendidly do they develop in size, substance, and purity, and their beauty in the evening light after sunset is quite beyond description, and I feel sure that, as time goes on, we shall see some very wonderful developments in this line.

THE BRODIE OF BRODIE, whose collection is possibly the finest in existence at present, has sent me a short list of what he considers the best garden varieties of those Daffodils that he grows. They are as follows:—*Beersheba*, *Trappist*, *Tenedos*, *Mitylene*, *White Sentinel*, *Hymettus*, *Moirra O'Neill*, *Firetail*, *Sunstar*, *Buttercup*, and *Dactyl*.

MR. R. O. BACKHOUSE: I don't entirely agree with what we have just heard. Of course, I am an advocate of reds. I don't agree that they always fade in the sun. If it does it does, if it doesn't it doesn't. One of the earliest of a series I have not brought down because I was not quite satisfied as to its growing. It flowers quite the earliest. I have had a number whose colour increases; they have opened yellow and come off orange. Because a previous generation was no use, it does not follow that the present generation is not.

MR. LEAK: I would like to supplement what Mr. BACKHOUSE has said about Red cups holding their colour. They hold their colour well in the garden; I think 'Sunrise' is the best. It is very vigorous and a good flower, and flowers very freely. It forces remarkably well, and holds its colour well in forcing. It is quite true 'Orange Glow' does open quite well and finishes quite right. I saw it yesterday where it had been open fourteen days. Another variety Mr. BACKHOUSE raised, 'Red Row'; a very indifferent-looking plant from the standpoint of quality, but it has a most brilliant flat cup which holds its colour in the centre better than any other flower I know; the perianth will fade before the cup goes out. Those are three varieties that came to my mind as Mr. Wilson was reading his paper. He spoke about there being not many good Jonquil hybrids. In my estimation the best Jonquil hybrid is the Yellow Trumpet variety 'Golden Goblet.' It has all the qualities of the Jonquil and will outlast 'Buttercup.' I consider that is a very great advance in the Yellow Trumpets, and I think it is going to lead us to a strain which will outdistance any we have got at the present time. There is one hint I would like to throw out about Yellow Trumpets generally. I dare say most amateurs are interested in getting new varieties if they can. If they would go to the trouble of saving self-fertilized seed from the bulbs they have, I think they would get better garden-plants than by buying other varieties. I have grown Daffodils for seventeen years; I think what we are getting now are flowers that will be splendid market flowers, and if they are splendid market flowers they are splendid growing flowers, because the two go together inevitably so far as Yellow Trumpets are concerned. I cannot add to Mr. WILSON's remarks, which were very valuable.

Mr. WILLIAMS : I don't know that I have a great deal to say, but I should like to say a few words to the raisers. We are perhaps dominated by the idea of florist's flowers. We know that a great deal of the development of the Daffodil is due to the florist. In the first place he develops the flower, gets people to take an interest in it, and has done an immense amount of good in this way ; but I am somewhat of opinion that raisers are too much dominated by the florist's idea. It may be a somewhat ungraceful remark by me. In my judgment there are four objects which the raiser should look at. He should consider the florist's flower, the market-flower, the flower for cutting, and the garden-plant. They are all four under different headings, and it is not many years ago that they were all judged by the florist. That has been somewhat revolutionized by the Narcissus Committee, though in my judgment the revolution has not been sufficiently complete. We judge Daffodils under those four headings, but it seems to me that in a room you are not capable of judging all those headings correctly. You can judge the florist's flower we all know, but you cannot judge the garden-plant from perhaps twenty-five flowers. Those plants should be tested at Wisley, and when they have been tested they should be submitted subsequently by the grower, whoever it may be, to the Narcissus Committee, who should give a final decision. The same remark applies to the market-flower. The market-flower has many absolutely necessary qualifications. It must be free of flowering ; it must bunch well and box well. It should be clear in colour, because a muddy colour always looks bad in the market, and should have some petal. If it hasn't it looks somewhat withered. Mr. LEAK called attention to ' Sunrise.' I should have thought it was quite among the best market-flowers. It is an extremely vigorous plant, easily bunched, boxes well and sells well, and another quality is that it does not weigh very much. The railway carriage on flowers is something very considerable, and that is quite a qualification. Well, those primary conditions could be better judged at Wisley than downstairs, where it seems to me quite impossible to judge the market-flower correctly and thoroughly by merely looking at a bunch of a dozen flowers in a jar. Then you come to the garden-plant. One test—I think, the only other test for a garden-plant that we have here—is for a rockery ; it has to be shown in a pot. As some of us know, some plants don't like pots. I think it would be well if the matter could be brought to the attention of the Council, and ask them to ask the Narcissus Committee to consider whether new and fresh regulations could be brought up with regard to market-flowers and garden-plants and also cut flowers. I think that cut flowers should be adequately arranged as cut flowers to go before the Narcissus Committee, and I think that this sort of object should be borne in mind by the raisers when they are selecting their seedlings. In an exhibition like this we could very well have a class for the best variety of cut flowers, not more than twenty-four or twenty-five, whatever you like, arranged in a standard jar which the Society would provide, and in such a class the qualifications of the flower

for decorative purposes should be the points on which the flower is judged. It should be the flower you are judging—the variety—and then you could award a prize for its qualifications, not for the arrangement. As to flowers burning in the sun, Mr. LEAK says 'Sunrise' does not burn. It will not be burnt to the cigar-ash point. Of course, the florist's flower is, I am afraid, the one thing which raisers look at, but if you come to look into the matter somewhat closely you will find you can measure your florists by tens, your market-growers by hundreds, and your gardeners and cut-flower folk by hundreds of thousands. I think we are making a mistake. I think we are lacking in a sense of proportion in concentrating too closely on the florist's flowers. If we could make an arrangement by which the raisers could be assisted and advised in any way I think it would be valuable.

Mr. LEAK: Mr. WILLIAMS has suggested that, instead of so many plants being judged by the Committee downstairs, all the best plants for the garden should be tried at Wisley. There is at the present time a trial of Daffodils at Wisley, and garden varieties are especially sent down there. This is the second year the plants were grown. This year it is suggested that they remain there for one more year, and probably we shall see them in much better form next year. There is also a tendency by the Council to send more plants down to Wisley before putting them before the Committee downstairs. For instance, Michaelmas Daisies are to be selected and sent to Wisley, and Phloxes. No direct awards are to be made at the Hall. There is no reason why, if the suggestion be made from this Conference, such a thing should not take place, and I think it will be all to the advantage of growers if we test them that way instead.

Mr. WILLIAMS: I would like to move "that it be a recommendation from this Conference to the Council to consider whether the present system of awards for market, for garden, and for cutting should be reconsidered as to whether any improvement could be devised."

Mr. JONES: I second that.

The CHAIRMAN: I may say that at the last meeting of the Wisley Garden Committee there was a very similar recommendation framed, and the system of giving awards here, in the Hall, for plants that really should be tried on their merits as garden-plants, should be somewhat altered, and there was a recommendation to the Council to appoint a Sub-Committee to go into the question. I am, therefore, very glad this Conference has strengthened our hands in that way, and it is probable that when they consider one point they may consider the others. It is interesting to me to find that the ideas that I have been preaching to deaf ears for the last twenty years are beginning to take root. I always maintained it was impossible for the public to be

guided as to how many thousand plants those flowers had been selected from. Now I think the Society is waking up to the fact that there is some truth in these suggestions.

The Resolution was carried.

Mr. MONRO: I think, Mr. Chairman, there should be a further division made between market and garden flowers.

The CHAIRMAN: That was understood.

Mr. EXLEY: I should like to ask what kind of soil it is at Wisley.

The CHAIRMAN: It has been described as being so light that if you threw it up in the air on a windy day it never came down again, but that is true only of part. Much is of the alluvial type that is usually regarded as excellent for the market cultivation of Narcissi.

Mr. EXLEY: If it is light soil it is not the proper soil to take them to.

Mr. CHAPMAN: I should rather back up what Mr. Exley has said. From all I have heard it is the reverse of an ideal soil.

Mr. N. POUPART: From my experience the trial is doing remarkably well in two years.

Mr. EXLEY: We ought to test them on some strong land as well. Personally, I think soil comes before climate.

The CHAIRMAN: Every man should be master of his fate and every gardener should be master of his soil; that is, I think, the secret of successful gardening.

The Conference then closed.

THE AWARD OF GARDEN MERIT. IX.*

BY F. J. CHITTENDEN, F.L.S., V.M.H.

58. COLCHICUM SPECIOSUM ALBUM.

Award of Garden Merit, October 6, 1924.

THE solid whiteness of the great flowers of this beautiful white form of *Colchicum speciosum* is exceeded by no other autumn-flowering plant, and equalled by few flowering at any season. White flowers too often lack character, or they are perhaps flimsy, or apt quickly to lose their pristine loveliness, or they are cold, or they need the foil of some deep colour to neighbour them so that they are both illumined and illuminate. There are many noble exceptions which even the many who do not like white flowers in their gardens will gladly welcome, and scarcely any, unless it be the Madonna Lily, would be more gladly welcomed than this. *Colchicum speciosum* itself is a fine plant in all its variety of rosy pinks, flowering in September before its great leaves appear, upstanding, graceful and handsome in its sturdy strength, fit to plant in great stretches in any garden where it may display its great Crocus-like flowers, and its foliage can be left until it dies in June, delighting in the sun, but tolerant of light shade, not too sensitive to winter moisture, good in short grass, and not niggard of its flowers, but *Colchicum speciosum album* is even more certain to please. Give both forms good soil and they will increase; plant the bulbs in July about four inches deep to the top of the bulb, and divide them in early July when they become too dense.

59. CISTUS × CYPRIUS.

Award of Garden Merit, July 5, 1926.

AMONG the white-flowered shrubs blossoming in June and July none growing at Wisley surpasses *Cistus × cyprius*. Like almost all the members of its genus, this is apt to be badly cut in our most severe winters, but it is less tender than *C. ladaniferus*, one of its supposed parents (for *C. × cyprius* is reputed a hybrid), and it will withstand nearly as much cold, wet weather as *C. laurifolius*, the other. *C. laurifolius* is probably the hardiest species in the genus, and there are 6 feet tall old bushes of it at Wisley at least thirty years of age, thriving and flowering finely every year. The bushes of *C. × cyprius* are as tall as these, but rather less rigid; they have narrower evergreen leaves, which take on the same grey sheen in autumn but are dull green above in summer, white flowers as large or larger, quite 3 inches

* For earlier annotated lists of Awards of Garden Merit and the grounds upon which it is given see vols. 47, p. 189; 48, pp. 58 and 223; 49, p. 233; 50, pp. 100 and 260; 51, pp. 84 and 337.

across, but with five blood-red blotches near the centre as in some forms of *C. ladaniferus*, and smooth, gummy branches like *C. ladaniferus*, not hairy like *C. laurifolius*. The flowers are in clusters, not singly borne as in *C. ladaniferus*. In the summer sun, like the two reputed parents, it scents the air with its fragrant gum and adds another charm to its flowers, its pleasant foliage, and its grace.

It is best accommodated on a dry bank exposed to full sun, and certainly calls for thorough drainage and disdains shelter. It may be best propagated by half-ripe cuttings with a heel, put in sand under a bell-glass, for seed is rarely produced, although in Mr. WILKS' garden some plants which should certainly be referred to *C. × cyprius* seeded freely and gave seedlings approaching both *C. ladaniferus* and *C. laurifolius*. It is as well to winter one or two young plants in pots in a frame, lest the weather prove too much for the older ones.

C. × cyprius is sometimes confused in gardens with the more tender *C. ladaniferus*, and it is figured in the *Botanical Magazine*, t. 112, under the latter name. SWEET'S *Cistineae*, t. 39, gives an excellent coloured plate.

60. POTENTILLA FRUTICOSA VILMORINIANA.

Award of Garden Merit, July 5, 1926.

Few species have a greater range over the mountains of the northern hemisphere than *Potentilla fruticosa*. A member of a genus of almost infinite variety, it is one of the few among its congeners with a persistent wood-stem, and one of the comparatively few of its genus worth growing in all its forms, and they are as numerous as its vast range would lead one to expect. On our own mountains in Teesdale, in Ireland, on the European Alps, the Pyrenees, the Caucasus, Urals, mountains of Siberia, and the Himalaya, over great areas in Western China and the Tibetan marches, in Japan, and in North America it is to be found, often in great abundance and (especially in China) in great variety. The European forms show comparatively little variation, except that the Pyrenean plant is dwarf and creeping and the more general one erect. This dwarf form has been called *P. prostrata*, but there seems no need to give it a distinct specific name when there are so many linking forms. Form of leaf, amount of down and the resultant tinge of leaf, number of leaflets, size and colour of stipules, stature, size and colour of flower, all vary, and names have been given to many of the forms, some well defined, others, alas! not well marked. The typical colour of the flower is bright yellow (deep gold in the best), but from that the forms pass through butter-yellow, citron, amber, cream, to white; and of the white-flowered forms possibly *P. davurica* is the extreme range. It has been characterized as a species, and, indeed, the true plant is well enough marked by its dwarf habit, deep-green glabrous foliage, slow compact growth and white flowers, but it has been confused with hairy-leaved forms which belong certainly to *P. fruticosa* (as, indeed, *P. davurica* possibly may). The variety

chosen for the award is another well-marked form, with white, rather creamy, flowers, more vigorous than *P. davurica*, making a rounded neat bush of about 2 feet in height with silvery-grey foliage which gives it an air of distinction and a beauty carried beyond its flowering season. Its flowering season also is useful, for it comes when the flowering of most shrubs is past and helps to tide over what is often apt to be a dull time in the shrub-garden, when the season of autumn tints and brilliant berries is yet to come.

61. PYRACANTHA COCCINEA LALANDEI.

Award of Garden Merit, December 8, 1925.

The value of this *Pyracantha* has already been referred to in these notes (see vol. 48, p. 59) and little more needs to be said about it. It will grow in almost any soil (but do not choose peat for it), is good in the open and against a wall, ripens its orange-red fruits rather earlier than *P. Gibbsii*, and, like that, in some seasons loses them through the delight birds take in them.

The fruit is sometimes disfigured by the attacks of a species of *Fusicladium*, related to the fungus which causes Apple scab, and this can be kept in check by spraying with Bordeaux mixture just after the petals fall, while a spray of paraffin emulsion on the ripening fruit wards off the attacks of birds for a while.

This variety was raised by M. LALANDE at Angers from *P. coccinea*, the South European representative of the genus, and named after him by DIPPEL.

62. HELIANTHEMUM HYBRIDS.

Award of Garden Merit, June 7, 1926.

The rock roses are all plants of the sunny, well-drained slopes of Central and Southern Europe, N. Africa, and Asia Minor, generally on limestone formations; but in our gardens we need not restrict them thus, for they thrive in any open soil, so that they have sun. Without it they do not open their flowers, with it they flower profusely, and day after day produce a plentiful crop from May onwards. The individual flowers last but a few hours and never overnight, but given such conditions as have been outlined the succession is rapid and continuous. The plants to which the Award of Garden Merit has been made are the progeny of three closely related species: *H. apenninum* (*polifolium*) and *H. vulgare* (*Chaemaecistus*), both of which grow wild in Great Britain, and *H. glaucum* from S. Europe. These three species are themselves variable in colour and foliage, and they and their varieties have interbred so that the rock roses are to-day inextricably confused, but what they have lost in the estimation of the botanist who wishes to put every plant into one species or another they have gained in variety and beauty, and because of this they merit a place in every sunny garden. Large numbers of seedlings have been raised, and many of these are described in our JOURNAL, vol 51, pp. 119-123.

where will be found a list of those selected for award after trial. Perhaps no one did more to raise striking and beautiful seedlings than the late Mr. JOHN NICOLL, in whose garden at Monifieth, near Dundee, so many originated. He died in January 1926, and his seedlings have fortunately passed into commerce, so that the best are likely to be preserved. Mr. E. M. CHRISTY of Emsworth has also raised many excellent seedlings, and so too did the late Mr. BROCK, gardener to the DUKE OF RICHMOND at Goodwood, where they made a great show in the rock garden. The seedling forms are easily struck under hand-lights or frames in sand from cuttings taken at the beginning of August or a little later with a heel.

They are excellent sub-shrubs for the sunny, dry wall, as well as for the rock garden, and their wiry stems are best cut back after flowering to prevent the plants from becoming too leggy. In very severe winters many are likely to be killed or badly damaged, and it is therefore wise to keep young plants in frames during winter.

63. ANAGALLIS PHILLIPSII.

Award of Garden Merit, June 7, 1926.

This is the first annual to which the Award of Garden Merit has been made: we call it an annual, for it is best treated as such, sown in March under glass, pricked out, and finally planted in a sunny, well-drained spot like any other half-hardy annual, preferring rich, light soil, but it is of perennial habit in its native Portugal and N. Africa. It may be raised by cuttings and wintered under glass, and this is a good way of preserving the best colour forms. Sir W. LAWRENCE tells me that slugs are very fond of it, and one may therefore need to apply one of the slug remedies to which this JOURNAL has recently directed attention. It grows 6 or 9 inches high, and freely produces flowers $\frac{1}{2}$ inch in diameter. *A. Phillipsii* was so named by DUBY, who took up a garden name in 1844, and it is generally regarded as a variety of the extremely variable *Anagallis linifolia*. DUBY made it a variety of *A. Collina* and accepted the figure of *A. Monelli* var. *Willmoreana* in the *Bot. Mag.*, t. 3380, as typical of it. Since then the nomenclature has been revised several times, according to the opinions of different botanists. The proper plant has blue flowers with a red ring in the throat, but unfortunately another form, properly called *A. Breweri*, with red flowers, has also passed under the name *A. Phillipsii*, and some stocks of seed may be found to yield both forms.

WISLEY ROSE AWARDS, 1926.

IN the last volume of our JOURNAL (vol. 51, p. 92) the plan adopted for testing the garden value of Roses was described and a list of Awards made to Roses up to the end of 1925 for value in the garden as distinct from exhibition was given.

The Awards made during 1926 on the recommendation of the Rose Judging Committee [Rt. Hon. Lord Lambourne, P.C. (Chairman), Mr. C. G. A. Nix (Chairman of the Wisley Committee) (Deputy Chairman), Mrs. Wightman, Dr. A. H. Williams, Dr. Lamplough, Mr. H. R. Darlington, Mr. H. Wettern, Mr. T. Hay, Mr. Coutts, Mr. G. Taylor, Mr. A. Dickson (jun.), Mr. Prince, Mr. Easlea, Mr. Poulsen, and Mr. Pernet-Ducher] are given below. The system of marking, etc., adopted in earlier years was again followed.

WISLEY ROSE AWARDS.

CLIMBING VARIETIES.

Award Class 1.

PAUL'S SCARLET CLIMBER, raised by Mr. W. Paul, sent by Messrs. Dobbie & Co., Edinburgh.

FRANÇOIS JURANVILLE, sent by Messrs. A. Dickson, Newtownards, co. Down.

Award Class 2.

FRAICHEUR, raised and sent by Messrs. Turbat, Orleans.

MRS. WALLIS, raised by Mrs. Wallis, sent by Mr. G. Carpenter, West Hall, Byfleet.

SINGLE VARIETIES.

Award Class 2.

IRISH FIREFLAME, raised and sent by Messrs. A. Dickson.

SEMI-DOUBLE AND DOUBLE DWARFS.

Award Class 2.

OLD GOLD, raised and sent by Messrs. McGredy of Portadown.

LULU, raised and sent by Mr. Easlea of Eastwood, Essex.

SOUVENIR DE MME. BOULLET, raised and sent by M. Pernet-Ducher.

GWYNNE CARR, raised and sent by Messrs. A. Dickson.

DWARF POLYANTHA VARIETIES.

Award Class 2.

ELLEN POULSEN, raised and sent by Messrs. Poulsen, Copenhagen.

CHATILLON ROSE, raised and sent by Messrs. A. Nonin, Paris.

The following varieties of Roses have been added to the trial and are additional to the list of those grown at Wisley given in vol. 51, pp. 97-100.

BARBARA ROBINSON (*A. Dickson*).

BLUSH QUEEN.

CLIMBING COMMANDEUR JULES

GRAVEREAUX (*La Loire*).

CLIMBING GEORGES ELGER (*La Loire*).

DAINTY BESS (*Archer*).

DORA STÖBER (*Leenders*).

DORIS DICKSON (*H. Dickson*).

EMILE CHARLES (*Bernaix*).

EMPIRE QUEEN (*Easlea*).

FELIX DYKHINS.

FREDERICK BIDDLE (*Morten*).

FRITZ MAYDT (*Leenders*).

GOORLAND GLORY (*van Rossem*).

GWYNETH JONES (*McGredy*).

HERA.

JOVUUS CAVALIER (*Archer*).

LA MYE AU ROI (*Bernaix*).

LADY FLORENCE STRONGE (*McGredy*).

LILLY JUNG (*Leenders*).

LORD LAMBOURNE (*McGredy*).

MADAME ALBERT BARBIER (*Barbier*).

MADAME EDOUARD HERRIOT (*Pernet-Ducher*).

MADAME L'HOT (*Bernaix*).

MARCIA STANHOPE (*Carter Page*).

MARTHA (?)

MAZZINI (*Easlea*).

MEVROUW L. C. VAN GENOTT (*van Rossem*).

MEVROUW NATHALIE NYPELS (*Leenders*).

MRS. FLIGHT.

MRS. R. B. MOLONY (*McGredy*).

PEGGY HUGHES (*Morten*).

PIUS XI (*Leenders*).

PRESIDENT F. A. DES TOMBE (*van Rossem*).

PRINCE HENRY (*Easlea*).

QUAKER GIRL (*Morten*).

ROSEBUD (*Morten*).

SALTAIRE (*A. Dickson*).

SANDER'S WHITE.

SCARLET GLORY (*A. Dickson*).

SOUVENIR D'ALEXANDRE BERNAIX (*Bernaix*).

VICTOR WADDILOVE (*McGredy*).

W. A. BILNEY (*Easlea*).

WHITE ENSIGN (*McGredy*).

WILLIAM J. FISH (*Fish*).

DAHLIAS AT WISLEY, 1926.

THE purpose and method of the Dahlia trials at Wisley have been fully described in earlier volumes of our Journal, and it is unnecessary, therefore, to do more than refer those who wish for information upon cultural details, etc., to the earlier reports. In these also will be found a full list of varieties which have, since the inception of the present method of testing for garden value, received awards or commendation. The list is a long one, but the varieties winning the awards are distributed among many types and colours of Dahlia, and reference to it will enable anyone to select colours and forms to their taste in Dahlias desirable for garden decoration. One hundred and ninety-eight new seedlings were shown at Vincent Square in 1925, and of these seventy-six were selected and grown in the trials at Wisley in 1926.

In addition to the usual trials where varieties selected at Vincent Square are grown, at the suggestion of the National Dahlia Society raisers were invited to send plant varieties of as many of the Mignon type (which has become so popular for bedding since the introduction of "Coltness Gem") as possible, and the invitation met a ready response. These varieties were planted on another site, on ground which had been in cultivation for a shorter time than that in which the other varieties are grown. A few of these commended themselves to the Joint Committee to which the judging of the Dahlias is entrusted, and these are described below, the other varieties being listed under their respective colours but having no further description for the present.

Only varieties grown or to which awards have been made for the first time in these trials are referred to below, and the order of classes is the same as has been followed hitherto.

It only remains to be noted that there is a remarkable and marked improvement in habit in almost all classes since these trials were instituted, and this is reflected in the greater use now made of Dahlias in gardens compared with a few years ago.

AWARDS, DESCRIPTIONS, AND NOTES.

Class I. SINGLE DAHLIAS.

AWARD.

The Countess, H.C. September 1, 1926. Raised and sent by Messrs. Cheal of Crawley.

Carmine.

CLIFTON (Dobbie)—3½ feet. Flowers of Type A; 2½ inches; bright purplish-carmine, suffused crimson at base; free, on 8- to 10-inch stems, carried well above foliage.

Orange-scarlet.

FANFARE (Cheal)—5½ feet. Flowers of Type A; 2½ inches, with ½-inch yellow disc; the palest of the orange-scarlets, shaded lemon at tips and round disc; free, on 8- to 10-inch stalks, well above foliage.

THE COUNTESS (Cheal), H.C.—5½ feet. Flowers of Type A; 2½ to 3 inches; orange-scarlet, with tips somewhat reflexed; free, on 4- to 10-inch stalks, well above foliage.

Class II. MIGNON SINGLE DAHLIAS.

AWARDS.

Lady Alleen, A.M. September 1, 1926. Raised by Lady Ardern, sent by Mr. H. Woolman of Shirley, Birmingham.

Kingscup, A.M. September 1, 1926. Sent by Messrs. Cheal.

H. J. Jones, A.M. September 1, 1926. Raised by Mr. H. J. Jones, sent by Messrs. Carter Page of London Wall, E.C., and Mr. H. J. Jones of Lewisham.

L'Innocence, H.C. September 1, 1926. Sent by Mr. Ballego of Leiden, Holland.

Pink Coltness Gem, H.C. September 1, 1926. Raised by Messrs. Watkins & Simpson, sent by Messrs. Dobbie of Edinburgh.

Louise, H.C. September 1, 1926. Raised and sent by Messrs. Cheal.

Daffodil, H.C. September 15, 1926. Raised and sent by Messrs. Cheal.

Pembroke, H.C. September 1, 1926. Raised and sent by Messrs. Cheal.

Turner's Gem, H.C. September 1, 1926. Raised and sent by Mr. C. Turner of Slough.

Kathleen, H.C. September 1, 1926. Raised and sent by Messrs. Cheal.

Dazzler, H.C. September 1, 1926. Raised and sent by Messrs. Cheal.

Jubel, H.C. September 1, 1926. Sent by Mr. Riding of Chingford.

Julius, H.C. September 1, 1925. Raised and sent by Messrs. Cheal.

Betsy, H.C. September 1, 1925. Raised by Mr. Dominicus, sent by Mr. Carlée of Heemstede, Haarlem, Holland.

Daphne, H.C. September 1, 1925. Sent by Messrs. Cheal.

White.*

L'INNOCENCE (Ballego), H.C.—16 to 18 inches. Flowers 4 inches, with medium disc; white with sometimes a cream tinge and on the back a faint carmine flush; free, on 8-inch stalks.

NIVEUS (Cheal).

ROEM VAN SCHIEDAM (Carlée).

White and Red.

SOLEURE (van Tubergen).

Yellow.

YELLOW TRANSPARENT (Carlée).

LOUISE (Cheal), H.C.—24 inches. Flowers 4 inches, with large disc; martius yellow with paler margins; free, on 8-inch stalk, well above foliage.

ADA (Riding).

DAFFODIL (Cheal), H.C.—24 inches. Flowers 3½ to 3½ inches, with medium disc; pale lemon; free, 6- to 8-inch stalks, well above foliage.

MIDGET (Dobbie).

MORNING LIGHT (van Tubergen).

COLTNESS YELLOW (Johns).

KINGCUP (Cheal), A.M.—24 inches. Flowers 3½ to 3½ inches, with medium disc; bright pale lemon, with faint pink flush occasionally on reverse; free, on 4- to 6-inch stalks, well above foliage.

DUNECHT (Cheal), also as DUNECHT YELLOW (van Tubergen) and DUNECHT GEM (Carter Page).

H. J. JONES (Carter Page, Jones), A.M.—20-24 inches. Flowers 4 to 4½ inches, with large disc; bright pale lemon; very free, on 6- to 9-inch stalks, well above foliage.

Yellow, tinged Red.

PEMBROKE (Cheal), H.C.—20 to 22 inches. Flowers 4 inches, with medium disc; martius yellow, with margins narrowly edged cerise; free, on 6- to 8-inch stalks, well above foliage.

DINKIE (Dobbie).

MOONBEAM (Dobbie).

POWERSCOURT YELLOW (Treseder).

NORTHERN BRONZE (Dickson & Robinson).

* The varieties in each section are placed so that the palest are at the beginning and the deepest at the end.

Pink.

- JUBILEE (Cheal).
 MAJOR VAN SWEETEN (Cheal).
 PRINCE HENDRIK (Carlée).
 NORTHERN GEM (Dickson & Robinson).
 PINK COLTNESS GEM (Dobbie), H.C.—See JOURNAL R.H.S., 51, p. 138.
 ROSALIND (van Tubergen).
 LADY AILEEN (Woolman), A.M.—22 to 24 inches. Flowers 3 to 3½ inches, with medium disc; very bright rose-red, with a crimson zone at base; free, on 6- to 8-inch stalks.
 FAIRY (Riding).

Salmon.

- ROSEBUD (Cheal).

Orange-scarlet.

- META (Cheal).
 JANET (Cheal), A.M.—See JOURNAL R.H.S., 48, p. 100.
 ORANGE FLAG (Carlée).
 GRACE (Cheal).
 COLTNESS SALMON (Johns).
 ORANGE GEM (Turner), H.C.—22 to 24 inches. Flowers 3½ to 3¾ inches; somewhat cup-shaped, with large disc; orange-scarlet; free, on 4- to 6-inch stalks, well above foliage.
 ORANGE NASSAU (van Tubergen).
 ORANJETELG (Ballego).
 KATHLEEN (Cheal), H.C.—22 to 24 inches. Flowers 3½ inches, with large golden disc; pale bright scarlet; free, on 4- to 6-inch stalks, well above foliage.

Scarlet.

- DAZZLER (Cheal), H.C.—20 inches. Flowers 3 to 3½ inches, with medium disc; scarlet, shaded orange; flat; on 4- to 6-inch stems, well above foliage.
 MINCIO (Cheal).
 NORTHERN SCARLET (Dickson & Robinson).
 JULES CLOSON (Carter Page).
 JUBEL (Riding), H.C.—22 inches. Flowers 3 to 3½ inches, with ¾-inch golden disc; scarlet; flat; on 4- to 6-inch stalks, well above foliage.
 RED RIDING HOOD (van Tubergen).
 ROODKOPJE (Carter Page).
 PETER PAN (Dobbie).
 JULIUS (Cheal), H.C.—20 to 22 inches. Flowers 3 inches, with medium disc; scarlet; flat; on 4- to 8-inch stalks, well above foliage.
 THOMAS MOORE (Riding).
 ETNA (Cheal).
 PRINCE OF ORANGE (Ballego).
 COLTNESS GEM (Purdie), A.M.—See JOURNAL R.H.S., 48, p. 100.
 BENBOW (Cheal).
 LANCER (Cheal).
 BETSY (Carlée), H.C.—16 inches. Flowers 3½ inches, with medium disc; flat; dark rich scarlet; on 6- to 8-inch stalks, well above foliage.

Crimson.

- HAROLD (Cheal).
 ROUGE ET NOIR (van Tubergen).
 AVONDROOD (Carlée).
 VESUVIUS (Riding).
 ROY (Cheal).
 ETHEL (Cheal).
 LUCIFER (van Tubergen).
 PICCANINI (Carter Page).
 ROI DES BORDURES (Ballego).

Maroon.

- DAFNE (Cheal), H.C.—24 inches. Flowers 3 to 3½ inches, with medium disc; rich crimson maroon; on 6- to 9-inch stalks, well above foliage.
 THE NIGHT (Carter Page).

Purple.

KABOUTER (van Tubergen).

RUBY (Riding).

COLTNESS PURPLE (Johns).

Class III. COLLERETTE DAHLIAS.

AWARD.

Mabel Mary, H.C. September 15, 1926. Raised and sent by Messrs. Cheal.

MABEL MARY (Cheal), H.C.—4½ feet. Flowers 4 inches; deep maroon, channelled rays, maroon-red white-tipped collerette; free, erect, well above foliage, on 6- to 12-inch stalks.

Class V. PÆONY-FLOWERED DAHLIAS.

AWARDS.

Festus, H.C. September 1, 1926. Raised and sent by Mr. C. Turner.

Mrs. E. BLOUNT (Cheal).—5 feet. Flowers 4 to 4½ inches; bright scarlet, rapidly fading; erect, on 6- to 12-inch stems.

FESTUS (Turner), H.C.—5½ feet. Flowers 5 inches; rays flat; rich rosy-crimson, fading at tip; erect, on 6- to 12-inch stems, well above foliage.

Class VI. SMALL-FLOWERED PÆONY-FLOWERED DAHLIAS.

AWARDS.

Yellow Queen, A.M. September 1, 1926. Raised and sent by Messrs. Cheal.

CINTRA, A.M. September 15, 1926. Raised and sent by Mr. A. J. Cobb of Reading University.

Mrs. H. C. Scrimgeour, A.M. September 15, 1926. Raised and sent by Messrs. Cheal.

Gloria, A.M. September 1, 1926. Raised and sent by Messrs. Burrell of Cambridge.

Clara Hart, A.M. September 1, 1926. Raised and sent by Messrs. Burrell.

Diophen, A.M. September 1, 1926. Raised and sent by Messrs. Burrell.

Hilda D. Wheeler, H.C. September 1, 1926. Raised and sent by Mr. Cobb.

Hosea, H.C. September 1, 1926. Raised and sent by Messrs. Burrell.

Olwen, H.C. September 1, 1926. Raised and sent by Messrs. Burrell.

Nanny, H.C. September 1, 1926. Raised and sent by Messrs. Burrell.

Pattie, H.C. September 1, 1926. Raised and sent by Messrs. Burrell.

Ada, H.C. September 15, 1926. Raised and sent by Messrs. Burrell.

Yellow.

YELLOW QUEEN (Cheal), A.M.—5 feet. Flowers 3½ to 4 inches; somewhat like "Star" class; pale lemon; free, erect, well above foliage, on 6- to 12-inch stalks.

CINTRA (Cobb), A.M.—3 feet. Flowers 3 to 3½ inches; flat; bright lemon-yellow; free, erect, on 4- to 8-inch stalks, well above foliage.

Rose on Yellow.

HOSEA (Burrell), H.C.—See JOURNAL R.H.S., 51, p. 140.

Pink.

HILDA D. WHEELER (Cobb), H.C.—3½ feet. Flowers 3½ to 4 inches; flat; bright pale salmon on lemon-yellow ground; erect, on 4- to 8-inch stalks, free, and well above foliage.

FEE ROSE (van Tubergen).—3½ feet. Flowers 4 inches; rays flat (inner twisted near disc); bright amaranth-pink; free flowering, erect, on 9- to 12-inch stalks.

Carmine to Purple.

THORA (Burrell).—3½ feet. Flowers 3½ inches; rosy carmine, with deep crimson zone at base; erect, free, on 6- to 10-inch stalks, well above foliage.

MYRA (Burrell).—4½ feet. Flowers 3½ to 4 inches; rays flat, crimson-carmine, shading to orange-buff at tips; erect, free, on 4- to 8-inch stalks.

ADA (Burrell), H.C.—5 feet. Flowers $3\frac{1}{2}$ inches; rays flat; bright rosolane-purple on yellow; erect, free, on 6- to 12-inch stalks.

Orange-scarlet.

OLWEN (Burrell), H.C.— $4\frac{1}{2}$ feet. Flowers 4 to $4\frac{1}{2}$ inches; outer rays flat, inner channelled; bright orange, with faint red flush and a scarlet zone at base; free, erect, on 6- to 10-inch stalks, well above foliage.

FALKA (Turner).—3 feet. Flowers $4\frac{1}{2}$ to 5 inches; bright orange, tipped cerise, with scarlet zone at base; erect.

Mrs. H. C. SCRIMEGROUR (Cheal).— $4\frac{1}{2}$ feet. Flowers 4 inches; outer rays flat, inner channelled; rich orange, suffused scarlet; free, erect, well above foliage on 4- to 8-inch stalks.

NANNY (Burrell), H.C.— $3\frac{1}{2}$ feet. Flowers 4 inches; outer rays flat, inner channelled; rich orange, flushed scarlet, with scarlet zone at base; free, erect, carried well above foliage on 6- to 10-inch stalks.

GLORIA (Burrell), A.M.—4 feet. Flowers 4 to $4\frac{1}{2}$ inches; outer rays flat, inner channelled; rich orange-scarlet, a shade paler than "Glamour"; free, erect, on 4- to 8-inch stalks, well above foliage.

Scarlet.

CLARA HART (Burrell), A.M.—5 feet. Flowers 4 to $4\frac{1}{2}$ inches; rays channelled; deep rich scarlet, darker than "Denys"; erect, free, on 6- to 12-inch stalks, well above foliage.

Crimson.

DIOPHEN (Burrell), A.M.—5 feet. Flowers $3\frac{1}{2}$ to $3\frac{3}{4}$ inches; outer rays flat, inner channelled; crimson-scarlet; free, erect, on 4- to 8-inch stalks, well above foliage.

BARODA (Burrell).— $3\frac{1}{2}$ feet. Flowers $3\frac{1}{2}$ to 4 inches; crimson; erect, on 4- to 8-inch stalks.

Maroon.

MARELLI (Burrell).— $4\frac{1}{2}$ feet. Flowers $3\frac{1}{2}$ to 4 inches; crimson-maroon.

Class VII. DWARF PÆONY-FLOWERED DAHLIAS.

AWARDS.

HERMIA, A.M. September 1, 1926. Raised and sent by Messrs. Burrell.

PAISLEY GEM, H.C. September 1, 1926. Raised and sent by Messrs. Thynne & Son of Dundee.

Pink.

MONTE (Dobbie).—30 inches. Flowers $3\frac{1}{2}$ to $4\frac{1}{2}$ inches; bright rich salmon, fading quickly; rather drooping, on 6- to 8-inch stalks.

Rose on Orange.

Mrs. FRANK DUNCAN (Treseder).—24 inches. Flowers $3\frac{1}{2}$ inches; bright, rich rosy cerise on orange; free, erect, well above foliage, on 6- to 10-inch stalks.

Crimson.

HERMIA (Burrell), A.M.—3 feet. Flowers 4 to $4\frac{1}{2}$ inches; rich orange, suffused rosolane-purple at tips and with crimson zone at base; erect, free, on 6- to 12-inch stalks.

Orange-scarlet.

PAISLEY GEM (Thynne), H.C.—22 inches. Flowers $3\frac{1}{2}$ inches; rays somewhat channelled; bright orange-scarlet; very free, erect, on 6- to 8-inch stalks, well above foliage.

Class VIII.—DECORATIVE DAHLIAS

AWARDS.

Mrs. A. R. Mountain, A.M. September 1, 1926. Raised and sent by Messrs. Cheal.

Menny Carléa, A.M. September 1, 1926. Raised by Mr. Vleeming, sent by Mr. Carléa.

Evelyn Hancock, A.M. September 1, 1926. Raised and sent by Mr. J. Stredwick of St. Leonards-on-Sea.

Macdonald, A.M. September 1, 1926. Raised and sent by Mr. W. F. Geijsendorfer of Aalsmeer, Holland.

Henry B. May, A.M. September 15, 1926. Raised and sent by Mr. J. Stredwick.

Secretary Voors, A.M. September 1, 1926. Raised and sent by Mr. Ballego.

Tally Ho, A.M. September 1, 1926. Raised and sent by Mr. J. Stredwick.

Joh. Mensing, A.M. September 15, 1926. Raised and sent by Messrs. Topsvoort of Aalsmeer.

Phaon, A.M. September 15, 1926. Raised and sent by Mr. Chas. Turner.

Jersey Beauty, A.M. September 1, 1926. Sent by Mr. H. J. Jones.

White Friar, H.C. September 15, 1926. Raised and sent by Mr. J. Stredwick.

H. Shoesmith, H.C. September 15, 1926. Raised and sent by Mr. H. Shoesmith of Woking.

Wembley, H.C. September 15, 1926. Raised and sent by Mr. J. Stredwick.

Apollyon, H.C. September 1, 1926. Raised and sent by Mr. C. Turner.

Fred Ransome, H.C. September 15, 1926. Raised and sent by Mr. J. Stredwick.

White.

WHITE FRIAR (Stredwick), H.C.—5 feet. Flowers 5 to 6 inches; rays recurved at margins; white; free, erect, on 6- to 10-inch stalks, well above foliage.

MENNY CARLÉE (Carlée), A.M.—See JOURNAL R.H.S., 51, p. 141.

Yellow.

EVELYN HANCOCK (Stredwick), A.M.—5½ feet. Flowers 5 to 6 inches; rays with margins recurved; white, faintly suffused pale sulphur; free, erect, on 6- to 10-inch stalks, well above foliage.

SHEIK (Stredwick).—5½ feet. Flowers 5 inches; flat; white, suffused pale lemon; late and scarcely above foliage.

Old Gold.

WEMBLEY (Stredwick), H.C.—See JOURNAL R.H.S., 51, p. 141.

Pink.

MARIE KING (Stredwick).—6 ft. Flowers 5 to 5½ inches; white, lightly flushed pale amaranth-pink; carried only just above foliage.

MRS. A. R. MOUNTAIN (Cheal), A.M.—6 feet. Flowers 5 inches; rays channelled; pale amaranth-pink; free, erect, on 6- to 10-inch stalks, clear of foliage.

SECRETARY VOORS (Ballego), A.M.—See JOURNAL R.H.S., 51, p. 141.

JERSEY BEAUTY (Jones), A.M.—4½ feet. Flowers 5 to 6 inches; rays channelled; bright salmon-pink on yellow; free, on 4- to 10-inch stalks, erect above foliage.

Orange-buff, shaded Salmon.

HENRY B. MAY (Stredwick), A.M.—6 ft. Flowers 5½ to 6½ inches; rays with recurved margins; pale orange-buff, shaded salmon, tips white, suffused with amaranth-pink; erect, free-flowering, on 6- to 14-inch stalks.

H. SHOESMITH (Shoesmith), H.C.—5 feet. Flowers 5 to 5½ inches; outer rays flat, inner channelled; free, on 6- to 14-inch stalks, erect.

AUREOLA (Dobbie).—3 feet. Flowers 4½ inches; rays rather curled; rich orange, with apricot shading near tips; erect, and well above foliage, on 6- to 10-inch stalks.

Orange-scarlet.

MACDONALD (Topsvoort), A.M.—4½ feet. Flowers 5 to 6 inches; rich orange-scarlet; erect, free, on 4- to 8-inch stems, well above foliage.

Scarlet.

TALLY HO (Stredwick), A.M.—4½ feet. Flowers 5 inches; rays flat, inner channelled; deep scarlet; erect, free-flowering, on 6- to 12-inch stalks, well above foliage.

JOH. MENSING (Topsvoort), A.M.—See JOURNAL R.H.S., 51, p. 141.

Crimson.

PHAON (Turner), A.M.—5½ feet. Flowers 5 inches; deep rosy-crimson; erect, on 6- to 10-inch stalks, free, well above foliage.

Purple.

HOMERIC (Stredwick).—5½ feet. Flowers nearly of cactus type; bright mallow-purple; only just above foliage.

Maroon.

APOLLYON (Turner), H.C.—5 feet. Flowers 4½ to 5 inches; deep crimson-maroon, fading quickly at tips to purplish maroon; well above foliage, on 6- to 12-inch stalks, erect.

FRED RANSOME (Stredwick), H.C.—See JOURNAL R.H.S., 51, p. 141.

Class IX.—SMALL-FLOWERED DECORATIVE DAHLIAS.

AWARDS.

Rose Elegance, A.M. September 15, 1926. Raised by Mr. J. Berghuis, sent by Mr. Carlée.

Cheal's Pink, A.M. September 15, 1926. Raised and sent by Messrs. Cheal.

Pink.

ROSE ELEGANCE (Carlée), A.M.—4½ feet. Flowers 4 inches; bright rich amaranth-pink; carried well above foliage on 4-inch stalks, free, erect.

CHEAL'S PINK (Cheal), A.M.—5½ feet. Flowers 3½ to 3½ inches; bright amaranth-pink, tipped white; on 6- to 10-inch stalks, carried well above foliage, erect, free.

Apricot.

GLORY OF MAASLAND (Riding).—3 to 3½ feet. Flowers 3 to 3½ inches; bright rich apricot with scarlet flush; erect and well above foliage, on 4- to 8-inch stalks.

Class X. DWARF DECORATIVE DAHLIAS.

AWARDS.

Preston, A.M. September 1, 1926. Raised and sent by Messrs. Dobbie.

Garden Love, H.C. September 1, 1926. Raised and sent by Messrs. Carlée.

Harrogate, H.C. September 1, 1926. Raised and sent by Messrs. Dobbie.

Yellow.

GLAMIS (Dobbie).—22 inches. Flowers 3½ to 3½ inches; outer rays flat, reflexed, inner channelled; pale sulphur; carried above foliage on 6-inch stalks, erect.

Rosy-red.

SOUTHPORT (Dobbie).—20 inches. Flowers 3½ inches; rays flat; bright rich rosy-scarlet; carried erect, well above foliage, on 4- to 7-inch stalks.

RESTALRIG (Dobbie).—24 inches. Flowers 3½ inches; rays with recurved margins; bright rosy-red, quickly fading; drooping, on 4- to 6-inch stalks.

HARROGATE (Dobbie), H.C.—24 inches. Flowers 3½ to 4 inches; bright cerise on yellow; free, well carried on rather weak 4- to 8-inch stalks.

Scarlet.

PRESTON (Dobbie), A.M.—32 to 34 inches. Flowers 3 inches; scarlet; on 4- to 6-inch stalks, erect, carried well above foliage and very free.

BARLOW'S BEDDER (Carter Page).—24 to 26 inches. Flowers 3½ inches; scarlet; free, on 6- to 9-inch stalks, erect.

Carmine.

GARDEN LOVE (Carlée) H.C.—16 to 18 inches. Flowers 3½ to 3½ inches; bright carmine on yellow ground; on 4- to 9-inch stalks, erect, carried well above foliage; free.

Purple.

PURPLE ROBE (Dobbie).—24 to 26 inches. Flowers 4 to 4½ inches; bright purplish magenta; drooping.

Class XI.—CAMELLIA-FLOWERED DAHLIAS.

AWARD.

Prudence, A.M. September 1, 1926. Raised and sent by Messrs. Burrell.

White, flushed rose.

PRUDENCE (Burrell), A.M. See JOURNAL R.H.S., 51, p. 142.

Class XII. POMPON DAHLIAS.

AWARD.

Mavis, A.M. September 15, 1925. Raised and sent by Messrs. Cheal.

White, flushed pink.

PRINCESS (Cheal).—4 feet. Flowers 2 to 2½ inches; white, faintly flushed; free, erect, just above foliage, on 6- to 10-inch stems.

Scarlet.

MAVIS (Cheal), A.M.—4½ feet. Flowers 2 to 2½ inches; deep scarlet; free, erect, well above foliage, on 6- to 10-inch stalks.

Class XIV. STAR DAHLIAS.

AWARDS.

Petworth Star, H.C. September 1, 1926.

Burstow Star, H.C. September 1, 1926.

Hyde Star, H.C. September 15, 1926.

Rusper Star, H.C. September 15, 1926.

Rowley Star, H.C. September 15, 1926.

Purple Star, H.C. September 1, 1926.

All raised and sent by Messrs. Cheal.

Pink.

PETWORTH STAR (Cheal), H.C.—See JOURNAL R.H.S., 51, p. 142.

FANTASY (Turner).—4½ feet. Flowers 3½ inches; amaranth-pink, shaded orange at centre and tipped white; free, on erect 4- to 8-inch stalks.

Mallow-purple.

BURSTOW STAR (Cheal), H.C.—See JOURNAL R.H.S., 51, p. 142.

HYDE STAR (Cheal), H.C.—3½ feet. Flowers 3 to 3½ inches; bright mallow-purple, shading to crimson at centre; erect and free-flowering on 6- to 10-inch stalks, well above foliage.

Cerise.

MILTON STAR (Cheal).—4½ feet. Flowers 3 inches; rosy cerise, shading to crimson at centre; erect, on 4- to 9-inch stalks, well above foliage.

Scarlet.

COLGATE STAR (Cheal).—3½ feet. Flowers 3 to 3½ inches; deep scarlet; carried erect and well above foliage, on 4- to 8-inch stalks.

Crimson.

RUSPER STAR (Cheal), H.C.—See JOURNAL R.H.S., 51, p. 142.

ROWLEY STAR (Cheal), H.C.—4½ feet. Flowers 3 to 3½ inches; rich crimson; free-flowering and erect, on 6- to 10-inch stalks.

Magenta.

PURPLE STAR (Cheal), H.C.—3½ feet. Flowers 3 to 3½ inches; bright purplish magenta; free, erect, and well above foliage, on 4- to 10-inch stalks.

Class XV. CACTUS DAHLIAS.

AWARDS.

ALICE AMOS, A.M. September 15, 1926. Raised and sent by Messrs. Stredwick.
SNOW BUNTING, H.C. September 1, 1926. Raised and sent by Messrs. Stredwick.

MARGARET, H.C. September 1, 1926. Raised and sent by Messrs. Stredwick.

White.

ALICE AMOS (Stredwick), A.M. See JOURNAL R.H.S., 51, p. 143.

SNOW BUNTING (Stredwick), A.M. See JOURNAL R.H.S., 51, p. 143.

ELITE (Stredwick).—4 feet. Flowers 5½ to 6 inches; white, with faint amaranth-pink flush; drooping, on 6- to 8-inch stalks, scarcely above foliage.

MARGARET (Stredwick), H.C.—4 feet. Flowers 5 inches; white; drooping, on 8-inch stalks, well above foliage.

Pink.

PINK FAVOURITE (Bruidegom).—3 to 3½ feet. Flowers 5 inches; pale rose-pink on white ground; erect, well above foliage, on 4- to 8-inch stalks.

FAIRYLAND (Shoesmith).—4 feet. Flowers 4½ to 5 inches; bright rosy amaranth; erect, scarcely above foliage, on 6- to 8-inch stalks.

TURKVOIS (Hornsveld).—3½ feet. Flowers 5 inches; rich rosy amaranth on lemon; drooping, on 4- to 8-inch stalks.

Salmon-pink.

J. EMBERSON (Stredwick).—4 feet. Flowers 6 inches; rays bright rich salmon, shaded lemon-yellow towards base, inner lemon, shaded salmon; erect, just above foliage, on 6- to 8-inch stalks.

Rose.

FLORIA (Shoesmith).—4 feet. Flowers 5 inches; bright rosy cerise, shaded apricot at centre; drooping, just above foliage, on 6- to 8-inch stalks.

ROVER (Stredwick).—4 feet. Flowers 5 inches; deep old-rose on lemon; drooping, on 4- to 8-inch stalks.

DIGNITY (Shoesmith).—3½ feet. Flowers 5 to 5½ inches; bright old-rose pink, shaded yellow at centre; drooping, only just clear of foliage, on 4- to 6-inch stalks.

LA FRANCE (Bruidegom).—4 feet. Flowers 5 inches; usually semi-double; bright rosy cerise on lemon, quickly fading; drooping, on 4- to 6-inch stalks.

Orange.

MARY MURRAY (Stredwick).—4 feet. Flowers 5 to 6 inches; bright bronzy orange-red; erect and well above foliage, on 6- to 10-inch stalks; late to commence flowering.

Scarlet.

FIREBRAND (Kroon).—4 feet. Flowers 5 inches; rays broadly quilled; rich scarlet, but fading rather quickly; well above foliage, erect, on rather short stalks.

GAIETY (Shoesmith).—4 feet. Flowers 5½ inches; scarlet, shading to orange-yellow in centre; erect, on 4- to 10-inch stalks.

CORRECT (Wouters).—A mixed stock.

HARRY STRUTT (Stredwick).—4 feet. Flowers 5 to 5½ inches; deep crimson-scarlet; drooping, on 6- to 8-inch stalks.

Lavender.

DOVE (Shoesmith).—4 feet. Flowers 5 inches; rosy lavender, flushed white; drooping, on 6- to 10-inch stalks.

Magenta.

NOBILITY (Stredwick).—4½ feet. Flowers 5 to 6 inches; bright purplish magenta; drooping, on 4- to 10-inch stalks.

Maroon.

NERO (Shoesmith).—4 feet. Flowers 5 to 6 inches; dark maroon; erect, just above foliage, on 4- to 8-inch stalks.

Class XVI. DWARF CACTUS DAHLIAS.

AWARD.

AMANDA, H.C. September 1, 1926. Sent by Messrs. Carter Page.

White.

EDELWEISS (Dobbie).—20 inches. Flowers 3½ inches; white; drooping, on 4- to 6-inch stalks, well above foliage.

Yellow.

GOLDPERLE (Dobbie).—18 inches. Flowers 3½ inches; lemon; drooping, on 4- to 6-inch stalks, well above foliage.

CITRONENVOGEL (Dobbie).—18 to 20 inches. Flowers 3½ inches, pale creamy yellow, flushed carmine at tip; drooping, on 4- to 6-inch stalks.

Pink.

AMANDA (Carter Page), H.C.—22 inches. Flowers 4 inches; white, flushed pale amaranth; erect and well above foliage, on 4-inch stalks.

JOHN MORTENSEN (Dobbie).—20 inches. Flowers 4 inches; bright coral on yellow; drooping, on 4- to 8-inch stalks.

GLADIOLI AT WISLEY, 1926.

SINCE the introduction of *Gladiolus primulinus* about thirty years ago a very large number of hybrids have been raised with it as a parent. The seeds appear to germinate freely and the seedlings flower quickly. As a result large numbers of *primulinus* Gladioli are advertised and grown, and the Council arranged for a trial of this section during 1926. Three hundred and forty-seven stocks, representing two hundred and eleven varieties, were sent in, and all were planted on April 29 in well-prepared ground near the rose arches. The Floral Committee inspected them on two occasions when in flower, viz. July 30 and August 12, and made recommendations for awards as shown below.

As several of the plants under trial exceeded in size the usual type of *primulinus* Gladiolus and in many cases also departed from the form usually associated with this flower, it has been deemed better to delay a full report upon them, to enable comparisons to be made with a greater range, and possibly to devise a classification which will indicate the range these forms cover better than does the present name.

AWARDS.

1. *Flowers white.*

L'Innocence, H.C. August 12, 1926. Raised by Messrs. Krelage and sent by Messrs. van Tubergen of Haarlem, Holland, Netherlands Gladiolus Society of Haarlem, Holland, and Messrs. Dobbie of Edinburgh.

White Lady, H.C. August 12, 1926. Raised and sent by Messrs. Nieuvenhuisen of Uitgeest, Holland.

2. *Flowers yellow.*

Souvenir, A.M. August 12, 1926. Raised by Mr. Jonkheer and sent by Messrs. R. Veitch of Exeter, Barr of King St., Covent Garden, W.C., Dobbie of Edinburgh, van Tubergen, Webb of Stourbridge, Dawkins of King's Road, Chelsea, and Bath of Wisbech [A.M. 1921 (Velthuys)].

La Lys, A.M. August 12, 1926. Raised by Messrs. Vilmorin-Andrieux and sent by Messrs. Bath.

Joannita de Castro, A.M. July 30, 1926. Raised by Messrs. Pfitzer and sent by Messrs. Bath and Pfitzer of Stuttgart, Germany.

Bernard Kuhn, A.M. August 12, 1926. Raised by Messrs. Pfitzer and sent by Messrs. Bath.

Coquette, H.C. August 12, 1926. Raised by Messrs. Krelage and sent by Messrs. van Tubergen.

Phyllis Kelway, H.C. August 12, 1926. Raised and sent by Messrs. Kelway, Langport, Somerset [A.M. 1916 (Kelway)].

Gelyce, H.C. August 12, 1926. Raised and sent by Major Churcher, Lindfield, Sussex.

Alborton, H.C. July 30, 1926. Raised by Messrs. Kundred and sent by Messrs. Bath, Amos of Bergholt Road, Colchester, and Lowe & Gibson of Crawley Down, Sussex.

Mrs. Swainson, H.C. August 12, 1926. Raised and sent by Messrs. Kelway [A.M. 1919 (Kelway)].

Sunrise, H.C. August 12, 1926. Raised and sent by Messrs. Grullemans of Lisse, Holland.

Orange Queen, H.C. August 12, 1926. Raised by Messrs. Pfitzer and sent by Messrs. Netherlands Gladiolus Society, Webb, van Tubergen, Konynenburg & Mark of Noordwyk, Holland, Dobbie, Barr, and Bath. Also sent by Messrs.

Pfitzer of Stuttgart, Germany, under the name 'Orange Königin'; this shares the award.

Bronze Queen, H.C. August 12, 1926. Raised and sent by Messrs. Grullemans.

Orange Brilliant, H.C. August 12, 1926. Raised by Messrs. Grullemans and sent by Messrs. Bath, Netherlands Gladiolus Society, Dawkins, van Tubergen, Grullemans, Amos, Barr, R. Veitch of Exeter, and Dobbie.

Ernst Zahn, H.C. August 12, 1926. Raised by Messrs. Pfitzer and sent by Messrs. Bath, and Pfitzer.

3. *Flowers pink.*

Ada, A.M. August 12, 1926. Raised by Messrs. Grullemans and sent by Messrs. Grullemans and Barr.

Ethelyn, A.M. August 12, 1926. Raised by Messrs. Fischer and sent by Major Churcher.

Malden's Blush, H.C. July 30, 1926. Raised by Messrs. Grullemans and sent by Messrs. R. Veitch, Barr, Grullemans, Webb, Dawkins, Netherlands Gladiolus Society, Bath, and Dobbie.

L'Authie, H.C. August 12, 1926. Raised by Messrs. Vilmorin-Andrieux and sent by Messrs. Bath.

Niobe, H.C. August 12, 1926. Raised by Messrs. Krelage and sent by Messrs. Bath, Barr, van Tubergen, and Dobbie.

Dorothy Wheeler, H.C. August 12, 1926. Raised by Messrs. Kundred and sent by Messrs. Dobbie and Bath.

4. *Flowers salmon.*

La Consance, A.M. August 12, 1926. Raised by Messrs. Vilmorin-Andrieux and sent by Messrs. Bath.

Walter Bloem, A.M. August 12, 1926. Raised by Messrs. Pfitzer and sent by Messrs. Pfitzer and Bath.

Marlon Cran, H.C. August 12, 1926. Raised and sent by Messrs. Kelway.

Inspector Ludewig, H.C. August 12, 1926. Raised by Messrs. Pfitzer and sent by Messrs. Bath.

L'Orillon, H.C. August 12, 1926. Raised by Messrs. Vilmorin-Andrieux and sent by Messrs. Bath.

Salmon Beauty, H.C. August 12, 1926. Raised by Messrs. Kundred and sent by Messrs. Amos and Bath.

Arlon, H.C. July 30, 1926. Raised by Messrs. Kundred and sent by Messrs. Bath.

Alice Tiplady, H.C. August 12, 1926. Sent by Messrs. Bath, Netherlands Gladiolus Society, Amos, Barr, and Dobbie.

Opal, H.C. August 12, 1926. Raised and sent by Messrs. Kundred of Goshen, Ind., U.S.A.

Linton, H.C. August 12, 1926. Raised by Messrs. Kundred and sent by Messrs. Bath.

Buenos Ayres, H.C. August 12, 1926. Raised and sent by Messrs. Pfitzer.

Anamora, H.C. August 12, 1926. Raised by Messrs. Kundred and sent by Messrs. Bath.

5. *Flowers cerise.*

Pinkie, A.M. August 12, 1926. Raised and sent by Messrs. Kelway.

Revue, A.M. August 12, 1926. Raised by Messrs. Glad. Bill and sent by Major Churcher.

Mrs. George Kellner, H.C. July 30, 1926. Raised and sent by Messrs. Lowe & Gibson of Crawley Down, Sussex.

Salmonea, H.C. July 30, 1926. Raised by Messrs. Krelage and sent by Messrs. Bath, Webb, van Tubergen, Netherlands Gladiolus Society, Barr, R. Veitch, and Dobbie.

Rosaura, H.C. August 12, 1926. Raised by Messrs. Krelage, and sent by Messrs. van Tubergen, Netherlands Gladiolus Society, Bath, and Dobbie.

Psyche, H.C. July 30, 1926. Raised by Messrs. Krelage and sent by Messrs. Netherlands Gladiolus Society, Webb, van Tubergen, and Bath.

Midsummer Dream, H.C. August 12, 1926. Raised by Messrs. Kundred and sent by Messrs. Bath, Lowe & Gibson, and Kundred.

Arden, H.C. August 12, 1926. Raised and sent by Messrs. Kundred.

Treclome, H.C. August 12, 1926. Raised and sent by Mr. W. S. L. Loat.

Rose Luisante, H.C. August 12, 1926. Raised by Messrs. Grullemans and sent by Messrs. Barr, Amos, Dobbie, and Bath.

6. *Flowers orange-scarlet.*

- Golden Gleam, A.M.** August 12, 1926. Raised and sent by Mr. Kundred.
Glio, A.M. July 30, 1926. Raised and sent by Messrs. Nieuvenhusen.
Rev. J. Stubbs, A.M. July 30, 1926. Raised and sent by Messrs. Kelway.
L'Arques, H.C. July 30, 1926. Raised by Messrs. Vilmorin-Andrieux and sent by Messrs. Bath.
L'Yser, H.C. August 12, 1926. Raised by Messrs. Vilmorin-Andrieux and sent by Messrs. Bath.

7. *Flowers scarlet.*

- Vinula, A.M.** July 30, 1926. Raised by Messrs. Krelage and sent by Messrs. van Tubergen and Netherlands Gladiolus Society.
Scarlet Cardinal, A.M. August 12, 1926. Raised by Messrs. Krelage and sent by Messrs. van Tubergen, Nieuvenhusen, Netherlands Gladiolus Society, Dobbie, and Bath.
Daphne, H.C. July 30, 1926. Raised by Messrs. Krelage and sent by Messrs. Dobbie, Netherlands Gladiolus Society, and Bath.
Firecrest, H.C. August 12, 1926. Raised and sent by Major Churcher.
L'Exuette, H.C. August 12, 1926. Raised by Messrs. Vilmorin-Andrieux and sent by Messrs. Bath.

8. *Flowers ruby.*

- Camillo Schneider, A.M.** August 12, 1926. Raised by Messrs. Pfitzer and sent by Messrs. Pfitzer and Konynenburg & Mark.

KOHL RABI.

THIS is a neglected vegetable in English gardens, but those who are familiar with it and grow it find it both useful and palatable when grown quickly and about the size of a tennis-ball. Thirty-two stocks were sent in for trial and were judged on two occasions during the season, and the Council's awards are shown below.

Two rows of each stock were sown, 24 inches being allowed between the rows and the plants being thinned to 12 inches apart in the rows.

DESCRIPTIONS, AWARDS, AND NOTES.

There appeared in this trial to be four types of Kohl Rabi. These were distinguished by the head leaves and the time each took to arrive at maturity. We have grouped the stocks sent for trial under these four headings, dividing the white-rooted kinds from the purple-rooted ones.

Type 1 consisted of plants with tall, large, coarse, and strong-growing foliage. These were later to mature than the other types and not so suitable for garden use.

Type 2 was somewhat dwarfer, with smaller foliage than those of the previous type, and less desirable for garden use than the following.

Type 3. The head leaves were few and small, being still dwarfer than Type 2, and the plants matured early. These and those in Type 4 are suitable for garden use.

Type 4. The plants were similar to those of Type 3, but with still smaller head leaves.

A. Roots greenish-white.

TYPE 1.

SANDER'S SMALL TOPPED (Watkins & Simpson).—Height 18 inches, foliage large, lobed, dull grey-green; root 4 inches diameter, globular, greenish-white; flesh cream, firm. Crop excellent. Ready July 31. Varies in foliage.

EARLY SHORT TOP GREEN (Dobbie).—Similar to 'Sander's Small Topped.'

SHORT TOP GREEN (Nutting).—Similar to 'Sander's Small Topped.'

EARLY GREEN VIENNA (A. Dickson).—Similar to 'Sander's Small Topped.'

WHITE VIENNA (Cooper, Taber).—Similar to 'Sander's Small Topped.'

TYPE 2.

EARLIEST PALE GREEN (Dawkins).—Height 12 inches; foliage dull grey-green, of medium size; roots 4 inches diameter, globular, greenish white; flesh firm, cream. Crop excellent. Ready July 18. Contained taller and coarser rogues.

DELICATESSE GREEN (Heinemann).—Similar to 'Earliest Pale Green.'

EARLIEST WHITE (Barr).—Similar to 'Earliest Pale Green.'

EARLY WHITE VIENNA (Herb).—Similar to 'Earliest Pale Green.'

FORCING WHITE VIENNA (Cooper, Taber).—Similar to 'Earliest Pale Green.'

TYPE 3.

AWARDS.

- { Extra Early, H.C. August 13, 1926. Sent by Messrs. Daehnfeldt and Theodor Jensen of Copenhagen, Denmark.
- { Dvorsky's Prague, H.C. August 13, 1926. Raised by Messrs. Dvorsky and sent by Messrs. Heinemann of Erfurt, Germany.

EXTRA EARLY (Daehnfeldt & Jensen), H.C.—Height 8 to 9 inches; leaves small, few, dull grey-green; roots 4 inches diameter, globular; flesh firm, cream. Crop excellent. Ready July 10.

DVORSKY'S PRAGUE (Heinemann), H.C.—Characters as 'Extra Early.'

EARLIEST GREEN (Dawkins).—Contained taller-growing rogues, otherwise like 'Extra Early.'

EARLY WHITE MARKET GARDEN (Zwaan & van der Molen).—Similar to 'Extra Early.'

GREEN VIENNA (Nutting).—Similar to 'Extra Early.'

TYPE 4.

AWARDS.

Early Vienna White, A.M. August 13, 1926. Sent by Messrs. Watkins & Simpson, Drury Lane, Covent Garden.

Sent also as **Earliest White** by Messrs Carter, Raynes Park, S.W., and **Delicatesse** by Messrs. Johnson, Boston, Lincs, which share the award.

EARLY VIENNA WHITE (Watkins & Simpson), A.M.—Height 8 to 9 inches; foliage small, dull grey-green; roots 4 inches diameter, globular; flesh firm, cream. Crop excellent. Ready July 10.

EARLIEST WHITE (Carter), A.M.—Like 'Early Vienna White.'

DELICATESSE (Johnson), A.M.—Like 'Early Vienna White.'

B. Roots reddish-purple.

TYPE 1.

EARLY SHORT TOP PURPLE (Dobbie).—Height 22 to 24 inches; foliage large, dark grey-green; roots 5 inches diameter, globular, reddish-purple; flesh firm, cream. Crop excellent. Ready August 3.

LARGE PURPLE (Nutting).—Like 'Early Short Top Purple.'

BLUE LARD (Heinemann).—Like 'Early Short Top Purple.'

TYPE 2.

AWARDS.

Forcing Purple Vienna, H.C. August 13, 1926. Sent by Messrs. Cooper, Taber, Southwark St., S.E.

Sent also as **Early Purple Vienna** by Messrs. A. Dickson, Newtownards, Co. Down, and **Extra Early Purple Vienna** by Messrs. Zwaan & van der Molen, The Hague, Holland, both stocks being Commended.

FORCING PURPLE VIENNA (Cooper, Taber), H.C.—Height 18 inches; foliage large, very dark dull grey-green; roots 4 inches diameter, globular, reddish-purple; flesh firm, cream. Crop excellent. Ready July 28.

EARLY PURPLE VIENNA (A. Dickson), C.—Like 'Forcing Purple Vienna.' Contained white-rooted rogue.

EXTRA EARLY PURPLE VIENNA (Zwaan and van der Molen), C.—Similar to 'Forcing Purple Vienna.' Ready August 3.

EARLIEST PURPLE (Dawkins, Carter).—Similar to 'Forcing Purple Vienna.'

VERY EARLY PURPLE VIENNA (Herb).—Similar to 'Forcing Purple Vienna.'

EARLY PURPLE (Bart, W. H. Simpson).—Similar to 'Forcing Purple Vienna.'

PURPLE VIENNA (Nutting).—Similar to 'Forcing Purple Vienna.'

DELICATESSE VIOLET (Heinemann).—Similar to 'Forcing Purple Vienna.'

PEAS AT WISLEY, 1925-26.

CULINARY peas were grown at Wisley in 1925 and 1926, seedsmen being invited to send early varieties in 1925 and mid-season varieties in 1926. In 1925, 257 varieties were received, and one row of each was sown on March 5 in rows at a suitable distance apart according to the height to which they were expected to attain. In 1926, 208 varieties were sown on March 30.

The stocks on the whole made good growth in both years. In 1925 varieties which were ready to pick (*i.e.* which had matured a sufficient number of pods on the 30-foot row to enable a picking to be made) by June 17, *i.e.* 105 days after sowing, were classed as first earlies, those which were ready to pick on June 30, *i.e.* 118 days after sowing, as second earlies.

Five unnamed seedlings and the following proved later than this, and cannot therefore be classed as earlies :

Abundance, Celebrity, Duke of Albany, Dwarf Prolific, Fill-basket, Giant Stride, James Kelway, Market Gardener, Mayflower, Model Mayflower, Phenomenon, Telegraph, Telephone.

In 1926 five unnamed seedlings were received and as no award was made to them they are not referred to below. The following varieties were also grown but proved late and are not further referred to :

Anticipation, Autocrat, Capt. Cuttle, Eureka, Reliable, Superlative, Mr. Richardson.

The first of the maincrop peas was ready to pick 104 days after sowing, viz. on July 12. In contrast with this an early variety ('Eclipse' = 'Earliest of All') sown at the same time was ready in 91 days from March 30.

As is to be expected, a good many varieties that have received awards in previous years were passed over as being less good than the best in these trials. With the passage of time new varieties have been raised which supersede the old, or old varieties have become mixed and stocks available at the moment are not true to type. Doubtless some of these old varieties will be cleansed of the rogues and regain the place they once held in the public esteem.

The following is a list of the varieties so passed over.

Among the early peas :

13, 14. Prelude [A.M. 1915 (Hurst)]; 15. Reading Wonder [A.M. 1920 (Sutton)]; 138. Primo [A.M. 1920 (Watkins & Simpson, Nutting)]; 173-179. Pilot [A.M. 1903 (Hurst)]; 114. First of the Season [A.M. 1915 (Cooper-Taber)]; 202-204. World's Record [A.M. 1915 (Sutton)]; 205, 206. Electricity [A.M. 1920 (Cooper, Taber)]; 239. Duchess of York [A.M. 1915 (Sutton)]; 140, 141. William I. [F.C.C. 1872]; 182. Ameer [A.M. 1901 (Sutton)]; 32-39. Little Marvel [A.M. 1902 (Sutton)]; 73-75. The Sherwood [A.M. 1901 (Hurst, Sutton)]; 80, 81. Excelsior [A.M. 1905 (Sutton)]; 86-90. Laxtonian [A.M. 1910 (Carter)];

97. Daisy [F.C.C. 1902 (Sutton)]; 99-101. Hundredfold [A.M. 1910 (Sutton)]; 115. Dwarf Defiance [A.M. 1901 (Sutton)]; 199. Early Morn [A.M. 1899 (Wingfield)]; 216. Aviator [A.M. 1920 (Laxton)]; 209, 210. Banqueter [A.M. 1920 (Laxton)]; 230, 231. Admiral Beatty [A.M. 1921 (Toogood, R. Veitch, Kelway, Carter)].

And among maincrop peas :

Danby Stratagem [A.M. 1916 (Carter)]; Superb [F.C.C. 1925 (Hurst, Nutting, Dobbie, Simpson, Kelway, Speed, Barr, Carter)]; Evergreen Delicatesse [A.M. 1916 (Carter)]; Glory of Devon [A.M. 1916 (Barr)]; Market King [A.M. 1916 (Carter)]; Gradus [A.M. 1920 (Toogood)]; Quite Content [A.M. 1916 (Barr, Carter)]; Elephant Marrow [A.M. 1921 (Carter)]; Market Gardener [A.M. 1916 (Carter)]; Harvestman [A.M. 1916 (Carter)]; Dawn [A.M. 1915 (Carter)]; Sharpe's Standard [A.M. 1916 (Barr)]; Duke of Albany [A.M. 1920 (Sutton, Carter)].

AWARDS, NOTES, AND DESCRIPTIONS.

A. FIRST EARLY VARIETIES.

A. 1 to 1½ foot.

1. *Seeds round.*

LE PETIT MERIDIONAL (Hurst).—Haulm 18 inches, medium green; pods single, somewhat curved, 2 inches, pointed, medium green; peas of medium size, green, 5 or 6 in a pod; mealy; crop good. Ready June 17.

EIGHT WEEKS (Carter)
EIGHT WEEKS or UNIQUE (Hurst) }.—Described vol. 46, p. 384. Ready June 17.

2. *Seeds wrinkled.*

PRELUDE (Hurst, Dobbie).—Described vol. 41, p. 282. Ready June 17.

READING WONDER (Dobbie).—Described vol. 46, p. 384. Stock not true, contained small and curved pods. Ready June 17.

B. 2 to 3 feet.

1. *Seeds wrinkled.*

AWARD.

Kelvedon Wonder, H.C. June 18, 1925. Raised by Messrs. Hurst and sent by Messrs. Hurst of Houndsditch, Dobbie of Edinburgh, and R. Veitch of Exeter. Recommended for small gardens.

KELVEDON WONDER (Hurst, Dobbie, R. Veitch), H.C.—Haulm 2½ feet, dark green; pods mostly in pairs, 2½ inches, pointed, straight, dark green; peas of medium size, bright green, 6 to 8 tightly packed in a pod. Ready June 18.

PREMIUM GEM (Morse).—Haulm 2½ feet, dark green; pods single, 2 to 2½ inches, blunt, straight, pale green; peas of medium size, pale green, 5 or 6 in a pod; crop good. Ready June 17.

C. 3 to 4½ feet.

1. *Seeds round.*

AWARDS.

Tip Top, A.M. June 18, 1925. Raised by Messrs. Cullen and sent by Messrs. Kelway of Langport, Cullen of Witham, Harrison of Leicester, Speed of Evesham.

Blue Bird, H.C. June 18, 1925. Raised by Messrs. Cullen and sent by Messrs. Cullen, Nutting of Southwark, A. Dickson of Belfast, Harrison, and Kelway.

Velocity, C. June 18, 1925. Raised and sent by Messrs. Hurst.

CHANTICLEER (Hurst).—Haulm 4½ feet, dark yellowish-green; pods single, 3 inches, pointed, somewhat curved, pale green; peas large, bright green, mealy, 7 or 8 in a pod; crop good. Ready June 15. Two stocks were sent under this name, one with yellow and the other with green seeds; except for this, the two were indistinguishable.

MARKET SURPRISE (Hurst).—Haulm 4½ feet, medium green; pods mostly single, 2½ to 3 inches, pointed, somewhat curved, medium green; peas of medium size, bright green, somewhat mealy, 6 to 8 in a pod; crop good. Ready June 17.

TIP TOP (Cullen, Harrison, Speed, Johnson, Kelway), A.M.—Haulm $4\frac{1}{2}$ feet, medium green; pods in pairs, 3 to $3\frac{1}{2}$ inches, pointed, tips somewhat curved, medium green; peas of medium size, bright green, mealy, 6 to 8 in a pod; crop very good. Ready June 14.

VELOCITY (Hurst), C.—Haulm 4 feet, medium yellowish-green; pods single, $2\frac{1}{2}$ inches, pointed, straight, medium green; peas small, bright green, juicy, 6 to 8 in a pod; crop very good. Ready June 14. Three stocks of this variety were sent, differing in colour of seed only.

PRIMO (Nutting).—Described vol. 46, p. 387. Ready June 17.

SPEED (A. Dickson).—Haulm $4\frac{1}{2}$ feet, medium green; pods mostly single, 3 to $3\frac{1}{2}$ inches, pointed, curved forward, dark green; peas large, bright dark green, juicy, 6 to 8 in a pod; crop good. Ready June 14.

EXTRA EARLY (Morse).—Haulm $4\frac{1}{2}$ feet, medium green; pods single, $2\frac{1}{2}$ to 2 $\frac{1}{4}$ inches, blunt, straight, very pale green; peas small, pale green, mealy, 6 to 8 in a pod; crop good. Ready June 15.

EARLY SOMERSET (Kelway).—Haulm $4\frac{1}{2}$ feet, dark yellowish-green; pods in pairs, 2 inches, blunt, straight, very pale green; peas small, light green, somewhat mealy, 6 to 8 in a pod; crop fair. Ready June 15. Contained tare-leaved rogues.

MEIDOPPER (Nunhem).—Haulm 4 feet, medium green; pods in pairs, 2 inches, blunt, straight, very light green; peas of medium size, pale yellowish-green, somewhat mealy, 4 to 7 in a pod; crop good. Ready June 14. Contained tare-leaved rogues.

CARACTACUS (Cooper-Taber).—Haulm 4 feet, medium green; pods single, 2 to $2\frac{1}{2}$ inches, blunt, straight, light green; peas of medium size, light yellowish-green, mealy, 6 to 8 in a pod; crop good. Ready June 14.

ECLIPSE (Harrison)

EARLIEST OF ALL (Nutting, Hurst, Dobbie, Carter) }—Described vol. 46, p. 384. Crop good. Ready June 14. Grown in 1926. Ready June 30 (sown March 30).

ALASKA (Morse).—Much like 'Eclipse,' but pods somewhat shorter. Crop good. Ready June 14.

WILLIAM I (Dobbie, Carter).—Described vol. 46, p. 387. Ready June 18. Messrs. Carter's stock contained paler and longer pods and was also dwarfer than that of Messrs. Dobbie.

EARLY BIRD (Cullen, Harrison, Speed, Kelway, Johnson).—Haulm $4\frac{1}{2}$ feet, dark green; pods in pairs, 3 to $3\frac{1}{2}$ inches, blunt, straight, medium green; peas large, bright green, juicy, 6 to 8 in a pod; crop good; seed yellowish. Ready June 15. Messrs. Kelway's stock contained pointed-podded rogues.

BLUE BIRD (Cullen, Nutting, A. Dickson, Harrison, Kelway), H.C.—Much like 'Early Bird,' but pods darker and seed gray-green. Crop very good. Ready June 16.

2. Seeds wrinkled.

SPRINGTIDE (Carter).—Haulm $4\frac{1}{2}$ feet, medium green; pods single, pointed, somewhat curved, dark green, $2\frac{1}{2}$ to 3 inches; peas large, bright dark green, 6 or 7 in a pod; crop good. Ready June 17. Also sent under this name by Messrs. R. Veitch, but in their stock the pods were in pairs, and it contained many small-podded types.

D. Over $4\frac{1}{2}$ feet.

Seeds round.

AWARD.

Superior, C. June 18, 1925. Introduced and sent by Messrs. J. Carter of Raynes Park.

LENTEDOPPER (Nunhem).—Haulm 5 feet, medium green; pods in pairs, straight, blunt, medium green, $2\frac{1}{2}$ inches; peas small, light green, 6 or 7 in a pod; crop good. Ready June 16.

GIANT BLUE EXPRESS (Carter).—Much like 'Giant Lightning,' but pods somewhat longer and foliage medium yellowish-green. Ready June 17. Seed pale gray-green.

VROEGE HAARSTEEGSCHJE (Nunhem).—Haulm $5\frac{1}{2}$ feet, medium green; pods in pairs, straight, blunt, light green, 2 to $2\frac{1}{2}$ inches; peas small, mealy, very light green, 6 or 7 in a pod; crop good. Ready June 16.

LIGHTNING (Carter).—Haulm 5 feet, medium green; pods in pairs, blunt, light green, straight, $2\frac{1}{2}$ inches; peas small, light yellowish-green, 6 or 7 in a pod; crop good. Ready June 15. Contained tare-leaved rogues.

SUPERIOR (Carter), C.—Haulm 5 feet, medium green; pods mostly in pairs, pointed, straight, $2\frac{1}{2}$ to $2\frac{3}{4}$ inches; peas of medium size, light green, juicy, 6 to 8 in a pod; crop good. Ready June 17.

WELCOME (Hurst).—Haulm 5 feet, light yellowish-green; pods in pairs, pointed, somewhat curved, dark green, $2\frac{1}{2}$ to 3 inches; peas large, bright dark green, 6 to 8 in a pod; crop good. Ready June 17.

B. SECOND EARLY VARIETIES.

A. 1 to $1\frac{1}{2}$ foot.

1. *Seeds round.*

AJAX (Hurst).—Haulm 18 inches, medium yellowish-green; pods mostly in pairs, pointed, straight, $2\frac{1}{2}$ to $2\frac{3}{4}$ inches, dark green; peas small, bright green, 6 to 8 in a pod; crop good. Ready June 20.

DWARF PILOT (Hurst).—Haulm 18 inches, medium green; pods single, pointed, 3 to $3\frac{1}{2}$ inches, straight, dark green; peas large, bright dark green, 6 to 8 in a pod; crop good. Ready June 24.

COUNCILLOR (Barr, Kelway).—Haulm 20 inches, medium green; pods in pairs, $2\frac{1}{2}$ inches, medium green, pointed, somewhat curved; peas small, medium green, 8 to 10 in a pod; crop good. Ready June 24.

TOM THUMB (Cooper-Taber).—Haulm 22 inches, medium green; pods mostly single, 2 to $2\frac{1}{2}$ inches, blunt, straight, pale green; peas small, light green, mealy, 6 to 8 in a pod; crop good. Ready June 22. Contained tare-leaved rogues.

2. *Seeds dent.*

EVESHAM No. 1 (Yates).—A mixed stock. Ready June 18.

3. *Seeds wrinkled.*

AMERICAN WONDER (Morse, Dobbie, Kelway, Johnson, Barr, van der Veld)

AMERICAN WONDER RESELECTED (Carter)

WONDER VAN AMERIKA (Nunhem)

} —Described
vol. 41, p. 284.

Messrs. Barr's and Messrs. Nunhem's stocks contained many tare-leaved rogues; in Messrs. Carter's stock the pods were much larger and broader than those of the others. Ready June 22. Messrs. Johnson's stock grown in 1926. Ready July 5 (sown March 30).

PIERREMONT GEM (Hurst).—Haulm 22 inches, medium yellowish-green; pods blunt, single, 3 to $3\frac{1}{2}$ inches, straight, dark green; peas large, bright green, of good flavour, 6 or 7 in a pod; crop good. Ready June 22.

CHELSEA GEM (Dobbie).—Described vol. 46, p. 384; crop good. Ready June 22. Contained tare-leaved rogues.

WITHAM WONDER (Cooper-Taber, Hurst, Kelway, van der Veld).—Haulm 20 inches. Described vol. 46, p. 386. Ready June 24.

WILLIAM HURST (Hurst, Johnson, van der Veld).—Described vol. 46, p. 386. Ready June 20. The last stock was somewhat taller than the others.

B. 2 to 3 feet.

1. *Seeds dent.*

AWARD.

Superb

Superb reselected

} F.C.C. June 18, 1925. Raised by Messrs. Laxton and sent by Messrs. Hurst, Nutting, Dobbie, W. H. Simpson, Birmingham, Kelway, Speed, Barr of King St., Covent Garden, W.C., and Carter. [A.M. 1913 (Laxton)].

SUPERB (Hurst, Nutting, Dobbie, W. H. Simpson, Kelway, Speed, Barr)

SUPERB RESELECTED (Carter)

} F.C.C. — Haulm

3 feet, medium green; pods in pairs, dark green, somewhat curved, pointed, $3\frac{1}{2}$ to 4 inches; peas large, bright dark green, 8 to 10 in a pod, sweet and juicy; crop very good. Ready June 18. Grown 1926, Messrs. Johnson's stock. Ready July 6 (sown March 30).

PRIDE OF THE MARKET (Barr).—Haulm 3 feet, very dark green; pods in pairs, 3 to $3\frac{1}{2}$ inches, pointed, straight, dark green; peas of medium size, medium green, 7 to 9 in a pod; crop good. Ready June 28. Contained tare-leaved rogues. Ready July 14 (sown March 30, 1926).

A stock under this name from Messrs. Hurst sown on March 30, 1926, had yellow foliage and paler pods. Ready July 16. Originated in New Zealand.

BUTTERCUP (Carter).—Haulm 2 feet, medium yellowish-green; pods mostly in pairs, 3 inches, pointed, somewhat curved, medium green; peas of medium size, light green, 6 to 8 in a pod; crop good. Ready June 26. Sown March 30, 1926. Ready July 13.

WORCESTER PRIDE (Speed).—Haulm 2 feet, medium green; pods single, 2½ to 3 inches, pointed, dark green, curved at tips; peas of medium size, bright dark green, 7 or 8 in a pod. Ready June 23.

2 Seeds wrinkled.

DWARF GEM (Webb).—Haulm 2 feet, medium green; pods mostly single, 3 inches, blunt, straight, dark green; peas large, bright dark green, 6 or 8 in a pod. Ready June 23.

LITTLE MARVEL (Nutting, Harrison, Morse, Dobbie, Webb, Kelway, van der Veld) }
LITTLE MARVEL SELECTED (Barr) } —Described
 vol. 46, p. 384. Ready June 22.

LITTLE MARVEL IMPROVED (Laxton).—Characters of 'Little Marvel,' but stock contained broader-podded type and plants with curved pods. Grown from Messrs. Johnson, 1926. Ready July 5 (sown March 30).

ENGLISH WONDER (Hurst, W. H. Simpson, Dobbie, Carter, Kelway, van der Veld).—Described vol. 46, p. 386. Ready June 22. Messrs. Simpson's stock contained much larger and broader-podded plants than others. All the stocks were mixed with 'American Wonder' type.

THE SHERWOOD (Hurst, Dobbie, Kelway).—Described vol. 43, p. 502. Stocks contained tare-leaved rogues. Ready June 24.

KING EDWARD VII (Hurst).—Characters of 'The Sherwood,' but pods pointed; crop good. Ready June 22.

WARWICKSHIRE PRIDE (W. H. Simpson).—Described vol. 46, p. 385. Haulm 2½ feet. Ready June 22.

SIXTY DAYS (Carter).—Haulm 2 feet, dark green; pods single, 2½ inches, pointed, straight, dark green; peas of medium size, bright dark green, 7 to 9 in a pod, sweet; crop good. Ready June 20.

BLUE BANTAM (Morse).—Haulm 2½ feet, medium green; pods single, 3 to 3½ inches, pointed, straight, dark green; peas large, bright dark green, 6 to 8 in a pod; crop good. Ready June 18.

PROGRESS (Laxton, Hurst, Nutting, Morse, Dobbie, Harrison, Cullen, Kelway, W. H. Simpson, Barr).—Described vol. 47, p. 81. Stocks not quite true, contained broader and more curved pods than type. Ready June 24. Requires further selection.

EARLY DWARF FAVOURITE (Carter).—Haulm 2½ feet, medium yellowish-green; pods mostly in pairs, blunt, straight, dark green, 2½ to 3 inches; peas large, bright green, of good flavour, 6 to 8 in a pod. Ready June 23.

EXCELSIOR (Morse, Barr).—Described vol. 46, p. 386. Ready June 23. The second stock contained many tare-leaved and taller rogues. Messrs. Morse's stock sown March 30, 1926. Ready July 8. Crop good.

SPLENDID (Kelway).—Haulm 2½ feet, medium yellowish-green; pods in pairs, straight, blunt, medium green, 3 to 3½ inches; peas large, bright, dark green, 6 or 7 in a pod; crop fair. Ready June 28.

MARVELLOUS (Hurst, Dobbie, Laxton).—Described vol. 46, p. 386. Ready June 22. The first two stocks contained tare-leaved rogues. A stock from Messrs. Johnson sown March 30, 1926, was ready July 8. Contained darker-foliaged rogues.

THE CROPPER (W. H. Simpson).—Haulm 2½ feet, dark green, tare-leaved; pods in pairs, blunt, straight, dark green, 3 inches; peas of medium size, bright green, 6 or 7 in a pod; good crop. Ready June 27. Two stocks sown March 30, 1926, from Messrs. W. H. Simpson and Messrs. Zwann & de Wiljes were recommended for main crop. Ready July 10.

REFERENDUM (Kelway, Harrison).—Described vol. 46, p. 385. Haulm 2½ feet. Ready June 22. Contained narrower-podded rogues.

PETER PAN (Dobbie, Barr, R. Veitch, W. H. Simpson) } —Described vol. 46, p. 386.

PETER PAN IMPROVED (Hurst).
 Ready June 24.

PIONEER (Nutting, Dobbie).—Described vol. 46, p. 386. Ready June 24. Stocks contained narrower-podded rogues.

EARLY FAVOURITE (Webb).—Haulm $2\frac{1}{2}$ feet, dark green; pods in pairs, pointed, straight, dark green, $\frac{3}{4}$ inches; peas large, bright green, of good flavour, 6 to 8 in a pod, many misses. Ready June 25.

SURPRISE (Webb).—Haulm $2\frac{1}{2}$ feet, medium yellowish-green; pods mostly in pairs, pointed, 3 to $3\frac{1}{2}$ inches, dark green, curved; peas large, bright dark green, 6 or 7 in a pod. Ready June 25. Contained tare-leaved rogues.

DAFFODIL (Carter, Barr).—Haulm 2 feet, medium green; pods in pairs, pointed, straight, dark green, 3 to $3\frac{1}{2}$ inches; peas large, bright green, 7 or 8 in a pod; crop good. Ready June 26. Contained tare-leaved rogues.

NEW MODEL DAFFODIL (Carter).—Characters as 'Daffodil' but pods longer (4 inches). Crop good. Ready June 24.

LAXTONIAN (Laxton, Dobbie).—Described vol. 46, p. 386. Ready June 26.

LAXTONIAN (W. H. Simpson)

LAXTONIAN IMPROVED (Hurst, Laxton).—Like last but foliage much darker.

EARLY DAISY (Carter).—Haulm $2\frac{1}{2}$ feet, dark green; pods in pairs, pointed, somewhat curved, medium green, 3 to $3\frac{1}{2}$ inches; peas large, light green, 7 or 8 in a pod; crop good. Ready June 27.

DAISY (Carter).—Much like 'Early Daisy,' but foliage pale and pods broader and darker. Ready June 28. Stocks of this variety from Messrs. Carter, Morse, Dobbie, and Hurst, sown March 30, 1926, were ready July 12. Of these Morse's and Hurst's stocks were true and even.

FORCING PEA (Carter).—Haulm 3 feet, dark yellowish-green; pods in pairs, pointed, straight, dark green, $\frac{3}{4}$ inches; peas large, bright dark green, 8 or 9 in a pod, many misses. Ready June 23. Contained curved-podded rogues.

HUNDREDFOLD (Hurst, Nutting, Dobbie).—Described vol. 46, p. 386. Ready June 22.

CHELSEA RIVAL (Hurst).—Haulm $2\frac{1}{2}$ feet, medium yellowish-green, tare-leaved; pods mostly single, pointed, straight, light green, $2\frac{1}{2}$ to 2 inches; peas small, pale yellowish-green, 5 to 7 in a pod; crop good. Ready June 22.

FEDERATION (Kelway).—Haulm $2\frac{1}{2}$ feet, dark green, tare-leaved; pods in pairs, pointed, curved, dark green, $\frac{3}{4}$ inches; peas small, medium green, 7 to 9 in a pod; crop good. Ready June 24.

DWARF PEERLESS (Webb).—Haulm $2\frac{1}{2}$ feet, medium green; pods in pairs, pointed, straight, dark green, $\frac{3}{4}$ to 4 inches; peas large, bright dark green, of good flavour, 7 to 9 in a pod; crop good. Ready June 25. Contained tare-leaved rogues.

LANCASHIRE LAD (Hurst, W. H. Simpson).—Haulm $2\frac{1}{2}$ feet, dark green; pods in pairs, curved, dark green, $\frac{3}{4}$ inches; peas large, bright dark green, 6 to 8 in a pod; crop good. Ready June 23. Stocks contained tare-leaved rogues.

DWARF DEFIANCE (Barr).—Haulm 3 feet, dark green; pods in pairs, pointed, straight, dark green, $\frac{3}{4}$ to 4 inches; peas large, bright dark green, 6 or 8 in a pod; crop medium. Ready June 28. A stock from Messrs. Johnson, sown March 30, 1926, and ready July 30, was commended as a main crop. Messrs. Barr's stock in that year contained tall rogues.

C. 3 to $4\frac{1}{2}$ feet.

1. *Seeds round.*

BENEFACITOR (Hurst, Barr, Kelway).—Haulm $4\frac{1}{2}$ feet, medium green; pods in pairs, $2\frac{1}{2}$ to $3\frac{1}{2}$ inches, pointed, somewhat curved, dark green; peas large, bright dark green, mealy, 6 or 7 in a pod; crop good. Ready June 18.

PILOT (Hurst, Cullen, Kelway, Dobbie, Barr, Johnson)

PILOT RESELECTED (Carter)

Ready June 18.

VANGUARD (Hurst).—Haulm $4\frac{1}{2}$ feet, medium green; pods mostly single, $3\frac{1}{2}$ inches, pointed, straight, dark green; peas large, bright dark green, somewhat sweet, 7 or 8 in a pod; crop good. Ready June 18.

2 *Seeds wrinkled.*

AWARD.

Gradus, H.C. June 18, 1925. Raised by Messrs. Laxton and sent by Messrs. Hurst, Morse of San Francisco, U.S.A., W. H. Simpson, Barr, and Kelway. Sent also under the name of 'Express' by Messrs. Dobbie, and this stock shares the award.

FIRST OF THE SEASON (Cooper-Taber).—Haulm 4 feet, medium yellowish-green; pods single, pointed, straight, medium green, $3\frac{1}{2}$ to $3\frac{3}{4}$ inches; peas large, bright green, sweet and juicy, 7 or 8 in a pod; crop good. Ready June 18.

DAYLIGHT (Carter).—Haulm $4\frac{1}{2}$ feet, medium green; pods in pairs, straight, pointed, dark green, 3 to $3\frac{1}{2}$ inches; peas large, medium green, sweet and juicy, 7 or 8 in a pod; crop good. Ready June 18. Contained taller rogue.

ADVANCE GUARD (W. H. Simpson).—Haulm $3\frac{1}{2}$ feet, dark green, tare-leaved; pods in pairs, pointed, curved, dark green, $3\frac{1}{2}$ inches; peas of medium size, bright green, 7 to 9 in a pod; crop good. Ready June 27. Contained tare-leaved rogues.

WORLD'S RECORD (Hurst, Harrison, Kelway).—Described vol. 41, p. 283. Crop good. Ready June 18. Stocks contained many smaller-podded types.

ELECTRICITY (Cooper-Taber, Kelway).—Described vol. 46, p. 388. Crop good. Ready June 18.

GRADUS (Hurst, Morse, W. H. Simpson, Barr, Kelway), H.C.—Haulm $4\frac{1}{2}$ feet, medium yellowish-green; pods mostly single, pointed, straight, 3 to $3\frac{1}{2}$ inches, dark green; peas large, bright dark green, sweet and juicy, 6 or 7 in a pod; crop very good. Ready June 20. Also sent as 'Express' by Messrs. Dobbie.

A stock sown March 30, 1926, from Messrs. Johnson was ready July 10, but contained many small-podded rogues.

DUCHESS OF YORK (Hurst).—Described vol. 41, p. 284. Ready June 18.

GOLDEN MORN (Carter).—Haulm $4\frac{1}{2}$ feet, pale golden-yellow; pods single, pointed, straight, light golden-yellow, 3 to $3\frac{1}{2}$ inches; peas of medium size, light yellow, of good flavour; crop fair. Ready June 23.

EARLY MORN (Carter).—Haulm $4\frac{1}{2}$ feet, medium yellowish-green; pods mostly in pairs, pointed, straight, dark green, 3 to $3\frac{1}{2}$ inches; peas large, bright dark green, 6 or 7 in a pod; crop good. Ready June 22.

D. Over $4\frac{1}{2}$ feet.

1. *Seeds round.*

AWARD.

British Lion, H.C. June 18, 1925. Raised by Messrs. Cullen and sent by Messrs. Hurst, Johnson of Boston, and Kelway.

GIANT LIGHTNING (Carter).—Haulm 5 feet, medium green; pods mostly in pairs, blunt, straight, medium green, $2\frac{1}{2}$ to 3 inches; peas of medium size, light green, 7 or 8 in a pod; crop good. Ready June 18. Seed yellowish-gray.

KROMBEK BOORDEVOL (Nunhem).—Haulm 5 feet, medium green; pods in pairs, pointed, straight, light green, 2 to $2\frac{1}{2}$ inches; peas small, very light green, mealy, 7 or 8 in a pod; crop good. Ready June 18.

STANDWELL (Cooper-Taber).—Described vol. 46, p. 387. Crop good. Ready June 18.

BOUNTIFUL (Hurst, Johnson, Kelway).—Described vol. 46, p. 388. The last two stocks contained many small-podded types. Ready June 18.

AMEER (Hurst).—Described vol. 46, p. 388. Crop good. Ready June 17.

BRITISH LION (Hurst, Johnson, Kelway), H.C.—Haulm 5 feet, dark yellowish-green; pods in pairs, pointed, straight, dark green, 3 to $3\frac{1}{2}$ inches; peas large, bright dark green, 5 to 7 in a pod; crop good. Ready June 18. Grown 1926. Ready July 6 (sown March 30).

RADIO (Yates).—Haulm 5 feet, medium yellowish-green; pods in pairs, pointed, straight, dark green, $3\frac{1}{2}$ to 4 inches; peas large, bright dark green, 8 to 10 in a pod; crop good. Ready June 18. Contained small and broader-podded rogues than type.

AMSTERDAMSCH DOPFER (Nunhem).—Haulm 6 feet, medium yellowish-green; pods in pairs, blunt, straight, light green, $2\frac{1}{2}$ inches; peas small, light yellowish-green, 5 to 7 in a pod; crop good. Ready June 22.

2. *Seeds dent.*

LEADER (Webb).—Haulm 5 feet, medium yellowish-green; pods in pairs, pointed, straight, dark green, $3\frac{1}{2}$ inches; peas large, bright dark green, 7 or 8 in a pod, packed tightly; crop good. Ready June 23.

AVIATOR (Laxton).—Described vol. 46, p. 388. Crop good. Ready June 21. Stock mixed with straight-podded rogues; seeds semi-wrinkled.

EVESHAM Q. Q. (Speed).—Haulm 5½ feet, dark green; pods in pairs, straight, pointed, dark green, 3½ inches; peas large, bright dark green, of good flavour; crop medium. Ready June 24.

ESSEX STAR (Cullen, Hurst, Dobbie, Kelway).—Described vol. 46, p. 387. Ready June 24. A stock from Messrs. Zwaan & van der Molen, sown March 30, 1926, ready July 13, contained many small-podded rogues.

3. *Seeds wrinkled.*

AWARDS.

Bedford Champion, A.M. June 18, 1925. Raised by Messrs. Laxton and sent by Messrs. Laxton of Bedford, Hurst, W. H. Simpson, and Kelway (A.M. 1920; then sent as 'S. T. Wright').

Early Duke, H.C. June 18, 1925. Raised and sent by Messrs. J. Carter.

Thomas Laxton, G. June 18, 1925. Raised by Messrs. Laxton and sent by Messrs. Hurst, Nutting, Morse, Dobbie, Johnson, Kelway, and Cullen (A.M. 1915).

THOMAS LAXTON (Hurst, Nutting, Morse, Dobbie, Johnson, Kelway, Cullen), **G.**—Haulm 5 feet, medium green; pods mostly single, blunt, straight, dark green, 2½ to 3½ inches; peas large, bright dark green, 7 or 8 in a pod; crop good. Ready June 18. Grown 1926. Ready July 5 (sown March 30).

EDWARD VII (Carter).—Haulm 5 feet, medium green; pods mostly in pairs, blunt, somewhat curved at neck, dark green, 3 inches; peas large, bright dark green, 7 or 8 in a pod. Ready June 18.

BEDFORD CHAMPION (Laxton, Hurst, W. H. Simpson, Dobbie, Kelway), **A.M.**—Haulm 5 feet, medium green; pods mostly single, 3½ to 4 inches, pointed, straight, dark green; peas large, of good flavour, bright dark green, 6 to 8 in a pod; crop very good. Ready June 18.

SCEPTRE (Johnson).—Haulm 5 feet, medium yellowish-green; pods single, pointed, straight, dark green, 3 to 3½ inches; peas large, bright dark green, 8 or 9 in a pod; crop good. Ready June 18.

EARLY DUKE (Carter), **H.C.**—Haulm 4½ feet, medium green; pods mostly in pairs, somewhat curved, dark green, 3 to 3½ inches; peas large, bright dark green, 7 to 9 in a pod; crop very good. Ready June 18.

BANQUETER (Laxton, Cooper-Taber).—Described vol. 46, p. 388, as 'Skipper.' Crop good. Ready June 22.

ADMIRAL BEATTY (Hurst, Barr).—Described vol. 46, p. 388. Crop very good. Ready June 27. See p.

TRIUMPHANT (Barr).—Haulm 6 feet, medium green; pods pointed, straight, dark green, 2½ to 3½ inches; peas large, bright dark green, of good flavour; crop medium. Ready June 27.

Of 'Duke of Albany' type, but earlier. A stock sown March 30, 1926, was ready July 8, but was irregular in height.

THE SOUTHWARK (Cooper-Taber).—Described vol. 47, p. 84. Crop good. Ready June 28. Contained narrower and paler-podded rogues.

SNOWDROP (Carter).—Described vol. 41, p. 289. Crop good. Ready June 22.

C. MAINCROP VARIETIES.

A. Above 2 feet and up to 3 feet in height.

I. Earlier Varieties.

1. *Seed wrinkled.*

AWARDS.

Phenomenon, H.C. July 19, 1926. Raised by Messrs. Sutton and sent by Messrs. Johnson of Boston, Lincs, and Messrs. Zwaan & van der Molen of Holland.

Duplex, H.C. July 19, 1926. Raised by Messrs. Laxton and sent by Messrs. Dobbie, Hurst, Laxton, and Nutting.

The Lincoln, H.C. July 19, 1926. Raised by Messrs. Lincoln and sent by Messrs. Morse and Johnson. Recommended as a canning pea.

Canner's Ideal, H.C. July 19, 1926. Sent by Messrs. Zwaan & van der Molen. Recommended as a canning pea.

Magnificent, H.C. July 19, 1926. Raised and sent by Messrs. Johnson.

Historian, H.C. July 19, 1926. Raised and sent by Messrs. Unwin of Histon, Cambs.

Universal, H.C. July 19, 1926. Raised by Mr. Clarke and sent by Messrs. Ryder, St. Albans.

Stratagem, H.C. July 19, 1926. Raised by Messrs. Carter and sent by Messrs. Morse.

Midseason King, H.C. July 19, 1926. Raised and sent by Messrs. Zwaan & de Wiljes, Holland.

Cropper, C. July 19, 1926. Sent by Messrs. W. H. Simpson and Messrs. Zwaan & de Wiljes, Holland.

PHENOMENON (Johnson, Zwaan & van der Molen), H.C.—Height 2 feet; haulm stout, foliage dark yellowish-green; pods in pairs, $3\frac{1}{2}$ to 4 inches long, broad, somewhat curved, pointed, medium green; peas large, 6 to 9 in a pod, of good flavour. Crop very good. Ready July 12.

DUPLEX (Dobbie, Hurst, Laxton, Nutting), H.C.—Height $2\frac{1}{2}$ feet; haulm stout; foliage dark yellowish-green; pods in pairs, $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, broad, pointed, straight, dark green; peas large, 7 to 9 in a pod, of good flavour; a few misses. Crop good. Ready July 8.

THE LINCOLN (Morse, Johnson), H.C.—Height $2\frac{1}{2}$ feet; haulm stout; foliage dark yellowish-green; pods in pairs, 3 to 4 inches long, somewhat broad, pointed, straight, dark green; peas of medium size, 6 or 7 in a pod, of good flavour. Crop very good. Ready July 8. A canning pea.

THE LINCOLN (Kelway, Harrison, Speed).—Less good stocks of the preceding. Contained taller rogues.

CANNER'S IDEAL (Zwaan & van der Molen), H.C.—Height 3 feet; haulm stout; foliage dark yellowish-green; pods in pairs, $3\frac{1}{2}$ inches long, somewhat broad, pointed, straight, dark green; peas of medium size, 6 or 7 in a pod, of fair flavour. Crop very good. Ready July 8. A canning pea.

CROPPER (W. H. Simpson, Zwaan & de Wiljes), C.—Height $2\frac{1}{2}$ feet; haulm stout; foliage dark gray-green; pods in pairs, $3\frac{1}{2}$ to $3\frac{1}{2}$ inches long, blunt, straight, dark green; peas of medium size, 7 or 8 in a pod, of good flavour. Crop good. Ready July 10. A canning variety.

MAGNIFICENT (Johnson), H.C.—Described vol. 48, p. 87. Ready July 13. Crop very good.

MAGNIFICENT (Nutting, Cooper-Taber).—Less good stocks of the preceding.

HISTONIAN (Unwin), H.C.—Height 3 feet, haulm stout, foliage dark green; pods mostly in pairs, many single, pointed, straight, dark; peas large, dark, 7 to 9 in a pod, flavour good. Crop very good. Ready July 11. A good even stock.

DWARF PROLIFIC (Murrell).—Height $2\frac{1}{2}$ feet; haulm stout; foliage dark gray-green; pods in pairs, broad, $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, pointed, straight, dark green; peas large, dark green, of fair flavour, 7 to 9 in a pod. Crop only fair. Ready July 15. A mixed stock.

SCHREMDA WONDER (Zwaan & de Wiljes).—Height $2\frac{1}{2}$ feet; haulm stout; foliage dark gray-green; pods in pairs, broad, $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, pointed, straight, dark green; peas large, dark, juicy, 8 to 10 in a pod, many misses. Crop good. Ready July 12. Raised by senders.

UNIVERSAL (Ryder), H.C.—Height $2\frac{1}{2}$ feet; haulm stout; foliage dark; pods in pairs, broad, $3\frac{1}{2}$ to 4 inches long, pointed, straight, dark green; peas large, dark, 6 to 8 in a pod, of good flavour. Crop very good. Ready July 15.

PEERLESS (Johnson).—Height $2\frac{1}{2}$ feet; haulm stout; foliage dark gray-green; pods in pairs, 3 to $3\frac{1}{2}$ inches long, pointed, straight, medium green; peas large, dark, 7 or 8 in a pod, of fair flavour. Crop good. Ready July 14.

GIANT STRIDE (Carter).—Height $2\frac{1}{2}$ feet; haulm stout, foliage dark; pods in pairs, broad, 4 to $4\frac{1}{2}$ inches long, pointed, dark green, curved; peas large, 6 or 7 in a pod, flavour good. Crop fair. Ready July 14. Another stock of this variety sent by Messrs. Carter was somewhat taller, otherwise similar. Raised by Messrs. Laxton.

DWARF QUITE CONTENT (Hurst).—A good stock, somewhat resembles 'Giant Stride.' Ready July 14. Crop poor. Raised by sender.

STRATAGEM (Morse), H.C.—Described vol. 48, p. 504. Pods in pairs, 4 to $4\frac{1}{2}$ inches long, dark green. Crop good. Ready July 14. A good even stock.

STRATAGEM SELECTED (Dobbie).—Irregular in height; contained pale-podded rogues.

STRATAGEM (Carter, Hurst).—Irregular in height.

STRATAGEM EXTRA SELECTED (Barr).—Irregular in height; contained pale-podded rogues.

MIDSEASON KING (Zwaan & de Wiljes), H.C.—Height 3 feet; haulm stout; foliage dark gray-green; pods in pairs, somewhat broad, 3 to $3\frac{1}{2}$ inches long, pointed, straight, dark green; peas of medium size, dark green, 7 or 8 in a pod, flavour good. Crop very good. Ready July 10.

II. Later Varieties.

1. *Seed wrinkled.*

ADMIRAL JELlicoe (Kelway).—Height 3 feet; haulm very stout; foliage dark yellowish-green; pods mostly in pairs, broad, $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, pointed, straight, medium green; peas large, dark green, 6 or 7 in a pod, flavour fair. Crop fair. Ready July 17. Raised by sender.

DANBY'S STRATAGEM (Carter).—Described vol. 43, p. 504. Ready July 17. A poor, irregular, mixed stock.

THE VICTOR (Johnson).—Described vol. 43, p. 511. Ready July 16. Contained tare-leaved rogues. Crop good.

CELEBRITY (Johnson).—Somewhat similar to 'The Victor,' but with marbled foliage and longer pods. Crop good. Ready July 17.

JAMES KELWAY (Kelway).—Described vol. 47, p. 82. Ready July 17. A good even stock.

B. Between 3 feet and 4 feet 6 inches.

I. Earlier Varieties.

1. *Seed dent.*

FILLBASKET (Barr, Carter) }
FILLBASKET IMPROVED (Cooper-Taber) } —Described vol. 47, p. 82. Ready July 14. Crop good. The first stock contained rogues.

GREEN MANTLE (Pennell).—Height $3\frac{1}{2}$ feet; haulm stout; foliage dark green; pods mostly in pairs, broad, $3\frac{1}{2}$ to 4 inches long, pointed, somewhat curved, dark green; peas large, dark green, 7 or 8 in a pod, of good flavour. Ready July 6. Crop good. Contained several tare-leaved rogues.

2. *Seed wrinkled.*

AWARDS.

Zenith, A.M. July 19, 1926. Sent by Messrs. Fidler of Reading.

ONWARD, H.C. July 19, 1926. Raised by Mr. Unwin and sent by Messrs. Barr, and Watkins & Simpson, Drury Lane, Covent Garden.

Dwarf Monarch, H.C. July 19, 1926. Raised and sent by Messrs. Carter.

Union Jack, H.C. July 19, 1926. Raised by Messrs. Hurst and sent by Messrs. Barr, Hurst, Kelway, Morse, W. H. Simpson, Cooper-Taber, and Dobbie.

Dwarf Defiance, C. July 19, 1926. Raised by Messrs. Sutton and sent by Messrs. Johnson.

ONWARD (Barr, Watkins & Simpson), H.C.—Height $3\frac{1}{2}$ feet; haulm very stout; foliage medium yellowish-green; pods mostly in pairs, broad, $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, blunt, straight, medium green; peas large, bright green, 6 to 8 in a pod, of fair flavour. Crop fairly good. Ready July 13.

ABUNDANCE (Barr).—Height $3\frac{1}{2}$ feet; haulm stout; foliage dark green; pods in pairs, medium width, 3 inches long, showing peas, blunt, straight, pale green; peas small, light green, 7 to 9 in a pod. Crop very good. Ready July 12.

DWARF MONARCH (Carter), H.C.—Described vol. 47, p. 83. Crop very good. Height $3\frac{1}{2}$ feet. Ready July 13. A good even stock.

PRINCE OF WALES (W. H. Simpson).—Described vol. 43, p. 503. Crop very good. Height $4\frac{1}{2}$ feet. Ready July 11. Contained taller and tare-leaved rogues.

ZENITH (Fidler), A.M.—Height $3\frac{1}{2}$ feet; haulm stout; foliage dark gray-green; pods mostly single, stout, 4 to $4\frac{1}{2}$ inches long, pointed, somewhat curved, dark green; peas large, dark green, 8 to 10 in a pod, flavour good. Crop very good. Ready July 8.

DWARF DEFIANCE (Johnson), C.—Height $3\frac{1}{2}$ feet; haulm stout; foliage dark green; pods mostly in pairs, broad, $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, pointed, straight, dark green; peas large, dark green, 7 to 9 in a pod. Crop good. Ready July 13.

PRESIDENT WILSON (Kelway).—New 'Dwarf Defiance,' but with longer and inflated pods. Crop fair. Ready July 13. A poor row.

SENATOR (Morse, Kelway, A. Dickson, Dobbie, Hurst, Harrison, Speed, Johnson).—Described vol. 43, p. 504. Crops very good. Ready July 8. Good true even stocks.

UNION JACK (Barr, Hurst, Kelway, Morse, W. H. Simpson, Cooper-Taber, Dobbie), H.C.—Characters similar to 'Senator,' but pods dark green. Crops very good. Height $4\frac{1}{2}$ feet. Ready July 11.

UNION JACK (Harrison).—A less even stock of the last.

PRESIDENT (A. Dickson, Dobbie, Hurst).—Too much like 'Union Jack.' Height 4 feet. Crops very good. Ready July 11.

GLORY OF SOMERSET (Kelway).—Described vol. 48, p. 87. Crop good. Ready July 14.

COMMONWEALTH (Carter).—Described vol. 48, p. 502. Crop poor. Ready July 14. Contained tall-growing rogues.

DELICATESSE (Carter).—Described vol. 48, p. 508. Crop good. Ready July 12.

EVERGREEN DELICATESSE (Carter).—Described vol. 47, p. 82. Crop good. Ready July 8.

GIANT DELICATESSE (Carter).—Described vol. 47, p. 84. Crop good. Ready July 8.

TITANIC (Pennell).—Height 3½ feet; foliage dark gray-green; pods mostly in pairs, broad, 4 to 5 inches long, pointed, straight, dark green; peas large, dark green, 7 to 9 in a pod, fair flavour. Crop fair. Ready July 14. A somewhat irregular stock.

RENOWN (Dobbie, Hurst).—Height 3½ feet; haulm stout; foliage dark green; pods mostly in pairs, broad, 3 to 4 inches long, pointed, somewhat curved, dark green; peas of medium size, bright green, 6 or 7 in a pod, of fair flavour. Crop fair. Ready July 12. Contained taller-growing rogues.

3. *Sugar Pea.*

GIANT BUTTER (Zwaan & van der Molen).—Height 4 feet; haulm stout; foliage dark gray-green; pods mostly single, of medium width, 4 inches long, pointed, much curved, medium green, walls of pods very thick; peas of medium size, dark green, 8 in a pod. Crop poor. Ready July 8. Raised by Mr. A. R. Zwaan.

II. Later Varieties.

1. *Seed wrinkled.*

AWARDS.

Royal Salute, H.C. July 19, 1926. Raised by Messrs. A. Dickson, Newtownards, Co. Down, and sent by Messrs. Hurst, A. Dickson, and Harrison [A.M. 1916].

{ **Lord Chancellor**, H.C. July 19, 1926. Introduced and sent by Messrs. J. Carter.

{ **Chancelot**, H.C. July 19, 1926. Raised by Mr. Bell and sent by Messrs. W. H. Simpson, Dobbie, and Zwaan & van der Molen.

Freedom, C. July 19, 1926. Raised and sent by Messrs. Hurst [A.M. 1922].

Glory of Devon, C. July 19, 1926. Raised by Messrs. R. Veitch, Exeter, and sent by Messrs. Hurst and Cooper-Taber.

YORKSHIRE HERO (Barr).—Described vol. 43, p. 502. Ready July 18. Crop fair.

DR. McLEAN RESELECTED (Carter).—Described vol. 43, p. 502. Crop fair. Ready July 21.

PERFECTION (Carter).—Described vol. 43, p. 503. Crop good. Ready July 22. Contained smaller-podded and tall-growing rogues.

GLORY OF DEVON (Hurst, Cooper-Taber), C.—Described vol. 43, p. 508. Foliage marbled. Crop very good. A few misses in pods. Ready July 17.

GLORY OF DEVON (Harrison).—Similar to last, but contained taller growing rogues.

PASSPORT (Hurst).—Described vol. 48, p. 87. Height 3½ feet. Irregular in height. Crop only fair. Ready July 18.

ROYAL SALUTE (Hurst, A. Dickson, Harrison), H.C.—Described vol. 43, p. 505. Good even stocks. Crops very good. Ready July 17.

LORD CHANCELLOR (Carter)

{ **CHANCELLOT** (W. H. Simpson, Dobbie, Zwaan & Van der Molen) H.C.—Described vol. 47, p. 85. Crop good. Ready July 18.

DISCOVERY (W. H. Simpson).—Described vol. 43, p. 502. Crop good. Ready July 18.

HENRY DRUMMOND (Kelway).—Height 4½ feet; haulm stout; foliage dark gray-green; pods in pairs, broad, 4 to 4½ inches long, somewhat pointed, straight, dark green; peas large, dark, 6 to 8 in a pod, of good flavour. Crop good. Ready July 21. Raised by sender.

THE GLADSTONE (Johnson).—Described vol. 43, p. 519. A good even stock. Crop good. Ready July 19.

LIBERTY (W. H. Simpson).—Characters similar to 'The Gladstone,' but pods paler. Crop fair. Ready July 21.

FREEDOM (Hurst), C.—Described vol. 43, p. 88. Crop good. Ready July 17.

FREEDOM (W. H. Simpson, J. C. Wheeler).—Less even stocks of the last.

JOHN BULL (Carter).—Described vol. 47, p. 84. Of 'Senator' type of pod, but later to mature (not 'John Bull' of Messrs. Laxton). Crop good. Ready July 16.

QUEEN IMPROVED (Carter).—A very poor mixed stock.

C. Above 4½ feet in height.

I. Earlier Varieties.

1. Seed dent.

a. Pods edible, flowers white.

GIANT SUGAR (Carter).—Height 6 feet; haulm stout; foliage large, medium green; pods single, stout, 4 to 4½ inches long, showing peas, blunt, straight, light green; peas large, light yellowish-green, somewhat mealy, 6 to 8 in a pod. Crop very good. Ready July 8.

REUZENPEUL (Nunhem).—Height 6½ feet; haulm stout; foliage dark gray-green; pods single, broad, 3½ to 4½ inches long, showing peas, somewhat pointed, straight, light green; peas of medium size, light yellowish-green, 7 to 9 in a pod. Crop good. Ready July 8.

b. Pods not edible.

AWARD.

Telegraph reselected	} C. July 19, 1926. {	Sent by Messrs. Zwaan &	} Award
Model Telegraph		van der Molen.	
recommended as a field pea.		Sent by Messrs. Carter.	

VERBETERDE CHÂTENAY (Nunhem).—Height 5 feet; haulm light yellow-green; foliage light bright yellowish-green; pods in pairs, of medium width, 3 to 3½ inches long, somewhat pointed, curved, light green; peas of medium size, light green, somewhat mealy, 7 or 8 in a pod. Crop very good. Ready July 6. A good even stock. Raised by sender.

REUZEN CHÂTENAY (Nunhem).—Height 5 feet; haulm stout; foliage dark yellowish-green; pods in pairs, of medium width, 4 to 4½ inches long, somewhat pointed, curved, bright medium green; peas of medium size, light green, 8 to 10 in a pod. Crop good. Ready July 8. Raised by sender.

MARKET FAVOURITE (Carter).—Described vol. 47, p. 86. Crop good. Ready July 12.

MARKET KING (Carter).—Described vol. 43, p. 505. Crop only fair. A poor row. Ready July 12.

SERPETTE FRANÇAISE (Carter).—Height 6 feet; foliage dark gray-green; pods in pairs, of medium width, 2½ to 3½ inches long, pointed, curved, medium green; peas small, pale, 7 or 8 in a pod. Crop very good. Ready July 10. Raised by sender.

TELEGRAPH RESELECTED (Zwaan & van der Molen)	} C.—Described vol. 43,
MODEL TELEGRAPH (Carter)	

p. 511. Crop good. Ready July 13.

TELEGRAPH (Dobbie).—Like last, but pods vary much in length.

TELEGRAPH SELECTED (Barr).—Contained many small-podded plants.

2. Seed wrinkled.

a. Pods edible, flowers white.

AWARD.

Melting Marrow Edible Podded, A.M. July 19, 1926. Introduced and sent by Messrs. J. Carter.

MELTING MARROW EDIBLE PODDED (Carter), A.M.—Height 6 feet; haulm stout; foliage medium gray-green; pods single, slender, 4 to 5½ inches long, pointed, much curved, dark green. Crop very good. Ready July 8.

b. Pods not edible.

AWARDS.

Duke of York, A.M. July 19, 1926. Raised and sent by Messrs. Cooper-Taber.
Admiral Beatty, A.M. July 19, 1926. Raised by Messrs. Laxton and sent by Messrs. Dobbie, Laxton, Barr, Hurst, Kelway, Harrison, W. H. Simpson, Johnson [A.M. 1921].

International (type), A.M. July 19, 1926. Raised and sent by Messrs. Hurst.
Alderman, A.M. July 19, 1926. Raised by Messrs. Laxton and sent by them and Messrs. Johnson [A.M. 1921].

Northampton Rival, H.C. July 19, 1926. Raised and sent by Messrs. Yarde, Northampton.

Prince Edward, H.C. July 19, 1926. Raised and sent by Messrs. Cooper-Taber.
Charnwood Bountiful, H.C. July 19, 1926. Raised and sent by Mr. A. Dew of Coalville.

Duchess II., H.C. July 19, 1926. Sent by Messrs. Hurst.

The Clipper, H.C. July 19, 1926. Sent by Messrs. Kelway of Langport. [F.C.C. 1917].

Early Gem, C. July 19, 1926. Raised and sent by Messrs. Johnson of Boston, Lincs. Award as a canning pea.

* **EXHIBITION (Carter).**—Height 6 feet; haulm stout; foliage dark yellowish-green; pods mostly in pairs, broad, $3\frac{1}{2}$ to $4\frac{1}{2}$ inches long, pointed, straight, dark green; peas large, dark green, 8 or 9 in a pod, flavour good. Crop good. Ready July 14. Raised by sender. Contained many small-podded plants.

THE SHROPSHIRE (W. Taylor).—Height 6 feet; foliage dark yellowish-green; pods mostly in pairs, stout, $3\frac{1}{2}$ to 4 inches long, pointed, straight, dark green; peas large, dark green, 7 to 9 in a pod, a few misses. Crop very fair. Ready July 13. Raised by sender.

THE SOUTHWARK (Cooper-Taber).—Of 'Gradus' type. Contained paler-podded rogues. Crop good. Ready July 12.

EARLY GEM (Johnson), C.—Height $4\frac{1}{2}$ feet; haulm of medium strength; foliage dark yellowish-green; pods in pairs, $2\frac{1}{2}$ to 3 inches long, blunt, straight, dark green; peas of medium size, bright green, 6 or 7 in a pod, of good flavour. Crop very good. Ready July 12. A canning variety.

REUZENKROMBEK ((Nunhem)).—Height $6\frac{1}{2}$ feet; foliage dark yellowish-green; pods mostly in pairs, 3 to $3\frac{1}{2}$ inches long, pointed, curved, dark green; peas of medium size, dark, 7 or 8 in a pod, flavour good. Crop good. Ready July 8. Raised by sender.

QUITE CONTENT (Johnson, Zwaan & van der Molen, Carter) } Described vol. 43, p. 508. Crop good. Pods with a few misses. Ready July 13. Both of Messrs. Carter's stocks contained many small-podded rogues.

ELEPHANT MARROW (Carter).—Described vol. 47, p. 87. Pod of 'Quite Content' type. Contained dwarf small-podded rogues. Crop good. Ready July 14.

DUKE OF YORK (Cooper-Taber), A.M.—Described vol. 47, p. 84. Height 5 feet; pods mostly in pairs. Crop very good. Ready July 12. Very near 'Admiral Beatty.'

DUKE OF YORK (Johnson).—Like the last, but contained several small-podded plants.

ADMIRAL BEATTY (Dobbie, Laxton, Barr, Hurst, Kelway, Harrison, W. H. Simpson, Johnson), A.M.—Described vol. 46, p. 388. Crop very good. Ready July 12.

ADMIRAL BEATTY (Morse, J. C. Wheeler).—Like the last, but the first stock contained dwarf rogues, the latter pale-podded rogues.

INTERNATIONAL (Hurst), A.M.—Height 5 feet; foliage dark gray-green; pods in pairs, many single, $5\frac{1}{2}$ inches long, somewhat pointed, straight, dark green; peas large, dark green, 8 or 9 in a pod, flavour good. Crop good. Ready July 11.

INTERNATIONAL (Carter).—Like the last, but contained many small-podded plants, row very irregular.

MARKET GARDENER (Carter).—Described vol. 43, p. 507. Crop poor. Ready July 13.

HARVESTMAN (Carter).—Described vol. 43, p. 507. Crop good. Ready July 14.

DAWN (Carter).—Described vol. 47, p. 85. Contained many small-podded plants. Crop good. Ready July 10.

TELEPHONE (Dobbie, Morse, Hurst).—Described vol. 43, p. 507. Crop good. Ready July 14.

TELEPHONE EXTRA SELECTED (Barr).—Like the last.

MODEL TELEPHONE (Carter).—Like 'Telephone.'

ALDERMAN (Laxton, Johnson), A.M.—Height 6 feet; haulm stout; foliage dark gray-green; pods stout, 4 to 5 inches long, pointed, somewhat curved, dark green; peas large, dark green, 9 to 11 in a pod, of good flavour. Crop very good. Ready July 12.

ALDERMAN (Barr, Hurst, Kelway, A. Dickson, Harrison, Speed, W. H. Simpson).—Less good stocks of the last.

NORTHAMPTON RIVAL (Yarde), H.C.—Of 'Alderman' type, with somewhat paler pods. Crop good. Ready July 13.

PRINCE EDWARD (Cooper-Taber), H.C.—Of 'Alderman' type. Crop good. Ready July 14.

PRINCE EDWARD (Nutting).—Like the last, but contained many small-podded plants.

CHARWOOD BOUNTIFUL (Dew), H.C.—Of 'Alderman' type. Crop very good. Ready July 8.

DUCHESS II. (Hurst), H.C.—Near 'Alderman' type, but with darker foliage. Crop very good. Ready July 13.

THE CLIPPER (Kelway), H.C.—Of 'Alderman' type. Crop good. Ready July 13.

DUCHESS I. (Hurst).—Of 'Alderman' type. Crop good. Ready July 12.

EXHIBITION (J. C. Wheeler).—Of 'Alderman' type. Contained small-podded plants. Crop very good. Ready July 13.

LORD LEICESTER (Harrison).—Of 'Alderman' type. Crop very good. Ready July 12. Raised by Messrs. Laxton.

PEACEMAKER (Kelway, Barr).—Of 'Alderman' type. Crop very good. Messrs. Barr's stock was a poor one. Ready July 13.

SHARPE'S STANDARD (Barr, Nutting).—Of 'Alderman' type. Crop very good. Ready July 13.

DUKE OF ALBANY (Dobbie, Barr).—Described vol. 43, p. 506. Messrs. Dobbie's stock contained many small-podded plants, while that of Messrs. Barr, though not quite true, was the better stock. Crop very good. Ready July 14.

DUKE OF ALBANY RESELECTED (Carter).—Like the last, but contained dwarf small-podded plants. Crop very good. Ready July 16.

II. Later Varieties.

Seed wrinkled.

AWARDS.

- { **No Plus Ultra**, H.C. July 19, 1926. Raised by Messrs. Carter and sent by Messrs. Johnson [F.C.C. 1922].
 { **Goldfinder**, H.C. July 19, 1926. Raised and sent by Messrs. R. Veitch of Exeter.

V.C. (Nutting).—Height 6½ feet; haulm very stout; foliage dark greenish-yellow; pods in pairs, broad, 4 to 5½ inches long, pointed, straight, dark green, inflated; peas large, dark green, 9 to 12 in a pod, a few misses, good flavour. Crop very good. Ready July 17. An exhibition variety. Raised by Messrs. Sutton.

REUZENDOPPER (Nunhem).—Height 6 feet; haulm stout; foliage dark yellowish-green; pods in pairs, broad, 4 to 5½ inches long, inflated, pointed, somewhat curved, medium green; peas large, dark green, 8 or 9 in a pod, flavour good. Crop good. Ready July 16.

BATTLESHIP (Carter).—Described vol. 43, p. 506. Contained dark and light green pods. Crop good. Ready July 16.

1920 MARROW (Carter).—Described vol. 47, p. 89. Contained many small-podded plants. Crop only fair. Ready July 17.

THE LANGPORT (Kelway).—Described vol. 47, p. 89. Contained smaller, narrower-podded rogues. Crop good. Ready July 16.

UTILITY (Kelway).—Height 6 feet; haulm stout; foliage dark gray-green; pods in pairs, broad, 3 to 4 inches long, pointed, straight, dark green; peas large, dark green, 7 or 8 in a pod, a few misses, flavour good. Crop good. Ready July 17. Raised by sender.

NE PLUS ULTRA (Johnson), H.C.—Described vol. 43, p. 91. Height 6 feet. Crop very good. Ready July 16.

GOLDFINDER (R. Veitch), H.C.—Characters as for 'Ne Plus Ultra.'

POTATOS AT WISLEY, 1924-5-6.

IN 1924, 42 stocks of first-early potatoes; in 1925, 57 of second-early; and in 1926, 46 of main-crop potatoes were grown under trial.

In almost every stock forty tubers were planted, and the weights of crop given show the yield of these forty tubers unless there is a statement to the contrary.

The tubers were planted in two rows at 18 inches apart in the rows, three feet being allowed between the rows.

It will be noticed that as a rule seed-tubers from northern sources have given the best results, although there are many exceptions, the chief cause of the differences in yield in different stocks of the same variety being in all probability the amount of mosaic or curl which they had contracted before they were planted.

AWARDS, DESCRIPTIONS, AND NOTES.

FIRST EARLY VARIETIES.

(a) *Tubers kidney, white or yellow.*

AWARDS.

Duke of York, A.M. August 15, 1924. Raised by Mr. G. Daniels and sent by Messrs. Daniels of Norwich and Garden Supplies of Liverpool [A.M. 1915]. Also sent under the names of 'Midlothian Early' by Messrs. Dobbie, Edinburgh, and 'O.K. Seedling' by Messrs. Garden Supplies. These share the award.

Immune Ashleaf, A.M. August 15, 1924. Sent by Messrs. Dobbie and Messrs. W. H. Simpson of Birmingham.

Sharpe's Express, A.M. August 15, 1924. Raised by Messrs. Sharpe and sent by Messrs. Dobbie, Garden Supplies, and W. H. Simpson [A.M. 1901 (Sharpe)].

Dargill Early, H.C. August 15, 1924. Sent by Messrs. Garden Supplies.

1. Flowers white.

WITCH HILL (J. W. Scarlett, Dobbie, W. H. Simpson, 'Garden Supplies').—Described JOURNAL R.H.S. 43, p. 117. Crop 71 lb.; 129 lb.; 99 lb.; 118 lb. (Scotch).

RESISTANT SNOWDROP (Dickson & Robinson).—In 1925 crop 88 lb. (Scotch).

DUKE OF YORK (Daniels, Garden Supplies), A.M.—Described JOURNAL R.H.S. 45, p. 363. Crop 160 lb.; 145 lb. (Scotch).

DUKE OF YORK (Carter).—Crop 84½ lb. (Scotch).

O.K. SEEDLING (Garden Supplies), A.M.—Like 'Duke of York.' Crop 130 lb. (Scotch).

MIDLOTHIAN EARLY (Dobbie), A.M.—Like 'Duke of York.' Crop 142 lb. (Scotch).

MIDLOTHIAN EARLY (W. H. Simpson).—Crop 120 lb. (Scotch).

NEW SUCCESS (Webb).—Like 'Duke of York.' Crop 86 lb. (Worcester).

RYBURGH EARLY (G. Stark).—Plant vigorous, dark yellowish-green; haulm 16 to 18 inches, somewhat spreading; foliage of medium size, rough, dull, crumpled; tubers of medium size, kidney, smooth; eyes large, shallow; sprouts white, tinged red; flesh dull white, firm, rather coarse, when cooked waxy, of fair flavour. Crop 82 lb. (Scotch). Raised by sender.

EARLY SHORT TOP (Harrison).—Plant vigorous, medium gray-green; haulm 14 inches, compact; foliage large, broad, rough, dull, somewhat crumpled;

tubers of medium size, kidney, rough; eyes many, large, sunken; flesh firm, fine, yellow, when cooked somewhat waxy, of fair flavour. Crop 59 lb. (Derbyshire).

2. Flowers lilac.

ASHLEAF (Webb).—Described JOURNAL R.H.S. 45, p. 363. Crop 85 lb. (Scotch).
OLD YELLOW ASHLEAF (G. Stark).—Like 'Myatt's Ashleaf.' Crop. 103 lb. (Scotch).

3. Flowers dark mauve.

IMMUNE ASHLEAF (Dobbie, W. H. Simpson), A.M.—Described JOURNAL R.H.S. 45, p. 364. Crop 127 lb.; 148 lb. (Scotch).

4. Flowers drop in bud.

SHARPE'S EXPRESS (Dobbie, Garden Supplies, W. H. Simpson), A.M.—Described JOURNAL R.H.S. 45, p. 364. Crop 147 lb. (diseased 10 lb.); 175 lb. (diseased 12 lb.); 152½ lb. (diseased 12 lb.) (Scotch).

EXPRESS (Webb, Carter).—Like 'Sharpe's Express.' Crop 121 lb. (diseased 6 lb.); 85 lb. (diseased 6 lb.) (Scotch).

SOUTHDOWN (Butcher).—Indistinguishable from 'Sharpe's Express.' Crop 69 lb. (diseased 4 lb.) (Sussex). Raised by sender.

MONTGOMERIE (Fulford).—A seedling from 'British Queen' × 'Sharpe's Express.' Crop 199½ lb. (Ayrshire). Grown 1925; indistinguishable from 'Sharpe's Express.'

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EARLY FAVOURITE (Carter).—A mixed stock, partly resembling 'Sharpe's Express.' Crop 93½ lb. (diseased 5½ lb.) (Scotch).

* * *

(b) Kidney, somewhat coloured.

1. Flowers mauve, tipped white.

DI-VERNON (Findlay, Dobbie).—Described JOURNAL R.H.S. 46, p. 392. Crop 64 lb.; 115 lb. (diseased 5 lb.) (Scotch). Raised by Mr. Findlay.

(c) Tubers round, white or yellow.

1. Flowers light mauve, tipped white.

AMERICA (Dobbie).—Plant vigorous, dark yellowish-green; haulm 20 to 24 inches, somewhat spreading, much tinged purplish-brown; foliage large, broad, rough, dull, somewhat crumpled; tubers large, smooth; eyes many, deep; flesh firm, fine, dull white, when cooked waxy, white, flavour fair. Crop 168 lb. (diseased 14 lb.) (Scotch). Introduced from America by sender.

2. Flowers none.

HARBINGER (Garden Supplies).—Described JOURNAL R.H.S. 45, p. 366. Crop 124½ lb. (diseased 11 lb.) (Scotch).

(d) Tubers round, coloured.

AWARD.

Early Pink Champion, C. August 15, 1924. Raised and sent by Mr. Findlay.

1. Flowers white.

EPICURE (J. W. Scarlett, Carter).—Described JOURNAL R.H.S. 45, p. 366. Crop 95½ lb. (diseased 12½ lb.); 113 lb. (diseased 1 lb.) (Scotch).

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EARLY PINK CHAMPION (Findlay), C.—Described JOURNAL R.H.S. 45, p. 366, as 'Early Champion.' Crop 155½ lb. (Scotch).

* * *

ARRAN ROSE (Dobbie, Webb, Carter).—Described JOURNAL R.H.S. 45, p. 366. Crop 125 lb. (diseased 5 lb.); 80 lb.; 75½ lb. (Scotch). Also sent in 1925 by Messrs. Dickson & Robinson. Crop 77 lb. (Ayrshire).

SECOND EARLY VARIETIES.

(a) *Tubers kidney, white or yellow.*

1. Flowers light mauve.

SECOND CROP (Mack & Miln).—Plant dark dull green; haulm 16 to 18 inches, erect, compact, little tinged brown; foliage large, rough, dull, somewhat crumpled; flowers many; tubers kidney, of medium size; skin yellowish, smooth; eyes many, shallow; eyebrows conspicuous; flesh firm, dull creamy-white; mealy, white when cooked; flavour poor. Crop 114 lb. (Yorkshire). Raised by senders. Diseased.

2. Flowers drop in bud.

GLENERIGHT (Garden Supplies).—Plant dark dull green; haulm 20 to 22 inches, somewhat spreading; foliage large, rough, dull, somewhat crumpled; tubers elongated kidney, of medium size; skin yellowish, smooth; eyes shallow; eyebrows conspicuous; flesh firm, pale lemon; waxy, dull creamy-white when cooked; flavour poor. Crop (Scotch) 96 lb. Raised by Mr. Keay. Diseased. Also sent by the Garden Supplies in 1926. Crop 62½ lb.

DARGILL EARLY (Garden Supplies), H.C.—Described JOURNAL R.H.S. 45, p. 364. In 1924 crop 134 lb. (diseased 3 lb.) (Scotch). Sent in 1925 by Messrs. Carter and Dickson & Robinson. Crop 89 lb. (Scotch) from each stock.

3. Flowers none.

CRUSADER (Dobbie).—For description see JOURNAL R.H.S. 47, p. 92. Crop (Scotch) 47½ lb.

(b) *Tubers kidney, coloured.*

1. Flowers mauve, tipped white.

CATRIONA (Dobbie, Kent & Brydon).—Much resembles 'Di-Vernon,' but the tubers are somewhat more tinged and the crop is much later to arrive at maturity. Crop (1924) 162½ lb. (diseased 13 lb.); 102½ lb. (diseased 9½ lb.) (Scotch). Raised by Mr. Findlay. Also sent under the name of 'Di-Vernon' by Messrs. Webb in error. Crop 140½ lb.; (diseased 3½ lb.) (Scotch). Also sent in 1925 by Messrs. Dickson & Robinson, Garden Supplies, Dobbie. Crop 97 lb.; 136 lb.; 126 lb. (Scotch). Sent in 1926 by Messrs. Carter. Crop 102 lb. (Scotch). Contained non-tinged rogue.

(c) *Tubers oval, white or yellow.*

AWARDS.

King George V., C. Oct. 9, 1925, and Oct. 18, 1926. Raised by Mr. Gardiner and sent by Messrs. W. H. Simpson; J. Carter, Raynes Park, S.W.; Garden Supplies; Dickson & Robinson, Manchester; Barr, Covent Garden (A.M. 1917). Award recommended for crop.

1. Flowers white.

KING GEORGE V. (W. H. Simpson, Barr, Carter, Garden Supplies, Dickson & Robinson), C.—Described JOURNAL R.H.S. 46, p. 392. Crop 184 lb. (Dumfries); 187 lb. (Fife); 206 lb. (Fife); 236½ lb. (Blairgowrie); 210 lb. (Scotch). In 1926 (Barr) crop 125 lb. (Scotch).

BRITISH QUEEN (Dickson & Robinson, Garden Supplies, Carter, Barr).—Described JOURNAL R.H.S. 41, p. 302. Messrs. Garden Supplies' stock contained mauve-flowered rogues. Crop 208 lb. (Ayrshire); 187 lb. (Blairgowrie); 191 lb. (Fife); 162 lb. (Fife). Somewhat diseased. Also sent in 1926 by Messrs. Barr. Crop 141½ lb. Sent as 'Irish Elegance' by Messrs. Barr. Crop 133½ lb. (Scotch).

BRITISH QUEEN (Barr).—The foliage of this was much paler and larger than in the preceding stocks, also the tubers were rounder in shape. Contained rogue of 'King Edward.' Crop 144 lb. (Lincs). Much diseased.

IRISH ELEGANCE (Barr).—Of 'British Queen' type. Crop 119 lb. (Ireland). Stock not true.

(d) *Tubers oval, coloured.*

AWARD.

K. of K., C. October 9, 1925. Raised by Mr. Findlay and sent by Messrs. Dickson & Robinson, W. H. Simpson. Award recommended for crop.

1. Flowers drop in bud.

K. OF K. (Dickson & Robinson, W. H. Simpson), C.—Described JOURNAL R.H.S. 46, p. 393. Crop 240½ lb. (Scotch); 169 lb. (Dumfries). Somewhat diseased.

* * *

KATIE GLOVER (Dickson & Robinson, Dobbie).—Described JOURNAL R.H.S. 46, p. 393. Crop 172½ lb. (Scotch); 170 lb. (Ross-shire). Much diseased.

(e) *Tubers round or flat round, white or yellow.*

AWARD.

1. Flowers white.

ARRAN COMRADE (Barr, Garden Supplies, Dobbie, W. H. Simpson, Dickson & Robinson).—Described JOURNAL R.H.S. 46, p. 393. Diseased. Crops respectively, 198 lb. (Fife); 194 lb. (Blairgowrie); 183 lb. (Ross-shire); 163 lb. (Dumfries); 185 lb. (Ayrshire). Somewhat diseased. Also sent in 1926 by Messrs. Barr. Crop 123 lb. (Scotch). Many chats, some second growth.

2. Flowers coloured.

EARLY PURITAN (Carter).—A mixed stock. Crop 113 lb. (Dumfries). Much diseased.

(f) *Tubers round, coloured.*

AWARDS.

Ardnell Rose, H.C. October 9, 1925. Sent by Messrs. J. Carter.

Edzell Blue, C. October 9, 1925. Sent by Messrs. Carter, Dickson & Robinson.

1. Flowers white.

ARDNEIL ROSE (Carter), H.C.—Plant large, dark gray-green; haulm 20 inches, compact, tinged brown; foliage large, rough, dull, somewhat crumpled; flowers many; tubers of medium size; skin light brown, much tinged pink, russetted finely; eyes rather deep; flesh firm, dull white, mealy, dull cream when cooked; flavour good. Crop 167 lb. (Scotch). Diseased. In 1924 (sent by Webb) the crop was 124½ lb. (Scotch), with some blight.

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EDZELL BLUE (Carter, Dickson & Robinson), C.—Described vol. 43, p. 118. Much diseased. Crop 209 lb. (Forfarshire); 170 lb. (Ayrshire). Diseased. In 1924 (Carter) crop 129 lb. (Scotch).

BANKER (Findlay).—Like 'Edzell Blue.' Crop 115½ lb. (Scotch). Raised by sender.

MAIN-CROP VARIETIES.

(a) *Tubers kidney, white or yellow.*

AWARD.

Majestic, C. October 18, 1926. Raised by Mr. Findlay and sent by Messrs. Dobbie, Edinburgh; Carter, Raynes Park S.W.; W. H. Simpson, Birmingham; W. G. Holmes, Tain; D & W. Croll, Dundee [A.M. 1921].

1. Flowers white.

MAJESTIC (Dobbie, Carter, W. H. Simpson, W. G. Holmes, D & W Croll), C.—Described JOURNAL R.H.S. 46, p. 391. Crop 103 lb., 82½ lb., 87 lb., 99 lb., 111½ lb. (Scotch seed). An early main-crop. In 1926 (Dobbie, Garden Supplies).—Crop 183 lb. (Scotch), 220 lb. (Scotch).

2. Flowers coloured.

BISHOP (Dobbie, W. H. Simpson).—Described JOURNAL R.H.S. 47, p. 91. Crop 95½ lb., 98½ lb. (Scotch seed).

(b) *Tubers kidney, brown.*

GOLDEN WONDER (W. H. Simpson, Dobbie).—Described JOURNAL R.H.S. 43, p. 140. The first stock contained flat-round rogue. Crop 95 lb., 83½ lb. (Scotch),

(c) *Tubers kidney, coloured.*

AWARD.

King Edward VII., H.C. October 9, 1925. Sent by Messrs. W. H. Simpson, Birmingham; Garden Supplies, Liverpool; Dobbie, Edinburgh.

King Edward VII., C. October 18, 1926. Raised by Mr. W. Keir and sent by Messrs. Carter, Barr, King St., Covent Garden, W.C., W. G. Holmes, Dobbie, and D & W. Croll.

1. Flowers white.

DUTCH SALAD (Dickson & Robinson).—Plant dark gray-green; haulm 24 inches, compact; foliage large, rough, dull; tubers elongated kidney, of medium size; skin yellowish, smooth; eyes deep; flesh firm, lemon, when cooked waxy dull cream; flavour fair. Crop 202 lb. (Lancashire). Sent as a salad variety. Much diseased.

* * *

2. Flowers coloured.

HIMALAYAN BLACK (Barr).—Plant dark yellowish-green; haulm 18 inches, much tinged purple, compact; foliage large, rough, dull, flat; tubers elongated kidney, small; skin smooth, purplish black; eyes deep; flesh firm, dark purplish; mealy, yellowish, with pink tinge under skin, when cooked; flavour very fair. Crop 47 lb. (Taplow). Sent as a salad variety.

3. Flowers drop in bud.

KING EDWARD VII. (W. H. Simpson, Garden Supplies, Dobbie), **H.C.**—See JOURNAL R.H.S. 43, p. 140. Crop 165 lb. (Dumfries); 168 lb. (Blairgowrie); 155 lb. (Ross-shire). Much diseased.

RED KING EDWARD (W. H. Simpson, Garden Supplies).—Characters as in 'King Edward VII.' but tubers coloured red all over. Crop 146 lb. (Dumfries); 169 lb. (Scotch). A red sport from 'King Edward VII.' Diseased.

ROYAL PURPLE (Garden Supplies).—Plant dark gray-green; haulm 16 to 18 inches, spreading; foliage of medium size, rough, dull, much crumpled; flowers few; tubers kidney, of medium size; skin yellowish-brown, little tinged purple near eye, smooth; eye shallow; eyebrows conspicuous; flesh firm, dull lemon; waxy, pale cream when cooked; flavour poor. Crop 56 lb. (Leicester). Said to be a sport from 'King Edward VII.'

KING EDWARD VII. (Barr [two stocks], W. G. Holmes, Dobbie, D. & W. Croll), **C.**—Described JOURNAL R.H.S. 43, p. 140. Crop 121½ lb., 130½ lb. (Scotch), 126½ lb. (Irish), 133½ lb., 134½ lb. (Scotch seed).

(d) *Tubers oval, white or yellow.*

AWARDS.

Up-to-Date, A.M. October 18, 1926. Raised by Mr. Findlay and sent by Messrs. Garden Supplies of Liverpool. Sent also as 'Irish King,' by Messrs. Barr [A.M. 1921], this stock sharing the award.

Field-Marshal, A.M. October 18, 1926. Sent by Messrs. Dobbie and W. G. Holmes.

Ally, C. October 9, 1925. Raised by Mr. McKelvie and sent by Messrs. Garden Supplies, W. H. Simpson (A.M. 1920).

1. Flowers white.

ALLY (Garden Supplies, W. H. Simpson), **C.**—Described JOURNAL R.H.S. 46, p. 392. Crop 212½ lb. (Blairgowrie); 201½ lb. (Dumfries). An early main-crop. Also sent in 1926 by Messrs. Dobbie. Crop 125½ lb. (Irish).

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KEAY'S CHAMPION (Garden Supplies).—Plant vigorous, dark dull gray-green haulm 26 inches, spreading; foliage large, rough, dull; flowers many; tubers medium to large, rough, russetted coarsely, light brown; eyes medium, shallow; sprouts light cream; flesh firm, fine, light lemon, when cooked somewhat waxy, creamy-white, of fair flavour. Crop 117 lb. (Scotch). Raised by Mr. J. Keay. Also sent in 1925 by Messrs. Garden Supplies. Crop 178 lb. (Scotch).

RHODERICK DHU (Dobbie, W. H. Simpson).—Described JOURNAL R.H.S. 47, p. 92. Crop 117 lb., 124½ lb. Many chats.

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GLENCOE (McAlister).—Plant vigorous, dark gray-green; haulm 26 inches, erect; foliage large, rough, dull, somewhat crumpled; flowers few; tubers medium to large, smooth; eyes medium, shallow; flesh firm, fine, dull creamy-white, when cooked very waxy, creamy-white, flavour poor; sprouts white tinged pink; Crop 140 ½ lb., ½ lb. diseased (Scotch). Raised by Mr. S. T. Farish. An early main-crop.

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INCOME (Dobbie).—Plant vigorous, dark gray-green; haulm 36 inches, compact, tinged brown; foliage large, rough, dull, somewhat crumpled; flowers many; tubers of medium size, rough; eyes small, shallow; flesh firm, fine, dull cream, when cooked mealy, creamy-white, of fair flavour. Crop 148 lb. (chats 17 lb.), (Scotch seed). Some second growth. Raised by Mr. C. Brown.

2. Flowers coloured.

TINWALD PERFECTION (Dobbie).—Described JOURNAL R.H.S. 43, p. 121. Crop 116½ lb., diseased 1 lb. (Scotch).

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UP-TO-DATE (Garden Supplies), A.M.—Described JOURNAL R.H.S. 43, p. 143. Crop 173½ lb., diseased 1½ lb. (Scotch). Under the name 'Irish King' from Messrs. Barr. Crop 141½ lb., diseased 1 lb. (Irish).

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FIELD-MARSHAL (Dobbie, W. G. Holmes), A.M.—Plant vigorous, dark gray-green; haulm 32 inches, erect, tinged brown; foliage large, rough, dull, somewhat crumpled, flowers many, light mauve; tubers medium to large, rough, russetted, dark brown; eyes small, shallow; sprouts tinged red; flesh firm, fine, dull creamy-white, when cooked mealy, white, flavour good. Crop 152½ lb., 194½ lb.; diseased ½ lb. (Scotch).

(e) Tubers oval, coloured.

WYCHWOOD RED (Moss).—Plant vigorous, dark gray-green; haulm erect, 24 inches, tinged brown; foliage large, rough, dull, much crumpled; flowers few, white; tubers smooth, of medium size, pinkish-red; eyes many, small, sunken; flesh firm, fine, lemon, when cooked waxy, creamy-white, of fair flavour; sprouts much tinged red. Crop 58½ lb. (Oxford). Raised by sender.

(f) Tubers round to flat round, white or yellow.

AWARDS.

Great Scot, A.M. October 9, 1925. Raised by Mr. McAlister and sent by Messrs. W. H. Simpson, Barr, Garden Supplies, Dobbie, Dickson & Robinson (A.M. 1920).

Sefton Wonder, H.C. October 18, 1926. Sent by Messrs. Garden Supplies.

Arran Chief, H.C. October 18, 1926. Raised by Mr. McKelvie and sent by Messrs. Dobbie, Garden Supplies [A.M. 1915].

Simpson's Victory, C. October 18, 1926. Raised by Mr. J. Simpson and sent by Mr. D. Keir.

1. Flowers white.

GREAT SCOT (W. H. Simpson, Barr, Garden Supplies, Dobbie, Dickson & Robinson), A.M.—Described JOURNAL R.H.S. 43, p. 140. Crops respectively 198 lb. (Dumfries); 187 lb. (Fife); 221 lb. (Blairgowrie); 210 lb. (Ross-shire); 207 lb. (Scotch). Disease slight. An early maincrop. In 1926 (Barr) crop 129½ lb. (Scotch). Some second growth.

ARTHUR'S FAVOURITE (Fulford).—Characters of 'Great Scot.' Crop 154½ lb. Contained mauve-flowered rogues.

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SEFTON WONDER (Garden Supplies), H.C.—Characters of 'Great Scot' except the tubers are russetted coarsely. Crop 145 lb. (Scotch). Some second growth. In 1925 from same source crop 164 lb. (Lancashire), with some disease.

ARRAN CHIEF (Dobbie, Garden Supplies), H.C.—Described JOURNAL R.H.S. 43, p. 142. Crop 159½ lb., 150½ lb. (Scotch). Many chats.

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SIMPSON'S VICTORY (Keir), C.—Plant vigorous, dark gray-green; haulm 24 inches, erect; foliage large, rough, dull, somewhat crumpled; flowers many; tubers medium to large, smooth, flattened; eyes small, shallow; sprouts white; flesh firm, fine, dull cream, when cooked somewhat waxy, white, of fair flavour. Crop 92 lb. (Scotch).

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MONTROSE (Carter).—Plant vigorous, dark yellowish-green; haulm 26 inches, erect; foliage large, rough, dull, somewhat crumpled; flowers many; tubers of medium size, smooth, somewhat flattened; eyes medium, shallow; flesh firm, fine, dull white, when cooked somewhat waxy, of fair flavour; sprouts tinged red. Crop 100 lb. (Lincolnshire). Contained coloured rogues. Tops green at lifting time.

2. Flowers drop in bud.

CORONA (Carter).—Plant vigorous, dark yellowish-green; haulm 26 inches erect; foliage large, dull, rough, crumpled; flowers few; tubers of medium size, rough, round; eyes medium, somewhat sunken; flesh firm, fine, dull white, when cooked somewhat waxy, flavour only fair; sprouts tinged red. Crop 118 lb. (Scotch).

(g) *Tubers round or flat round, coloured.*

1. Flowers white.

AWARD.

Kerr's Pink, C. October 18, 1926. Raised by Mr. Henry and sent by Messrs. Dobbie, Croll, W. H. Simpson [A.M. 1921].

KERR'S PINK (Dobbie, Croll, W. H. Simpson), C.—Described JOURNAL R.H.S. 47, p. 90. Crop 143½ lb., 145 lb., 132 lb. (Scotch seed). Much second growth.

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ARRAN VICTORY (Carter, W. H. Simpson).—Described JOURNAL R.H.S. 47, p. 94. Crop 150 lb., 147 lb. (Scotch). The first stock contained two pink rogues. Tops green at lifting time. Many chats.

BOOK REVIEWS.

"The Small Fruits of New York." By V. P. Hedrick and others. 4to. 614 pp. (New York State Experimental Station, 1925.)

With the present volume the author completes the conquest of the Hardy Fruits of New York, and with his Generals must, like another great conqueror, sigh for other worlds to subdue. The six stout volumes which now stand, or should stand, on the shelves of every pomologist's library form a corpus the like of which has not been seen since Poiteau and other great French authors laid down their task. Nor can we in Europe hope in our day to find a generous State willing and able to supply the funds without which no publisher could undertake a similar enterprise.

"The Small Fruits of New York" follows the lines laid down in previous volumes: stately octavo pages, coloured plates in the best style that photo-colour work has attained, history, description, and interesting biographical notes combine to produce an attractive volume.

The first section deals with "Bramble Fruits," a name which might well be adopted in this country to cover the Logan Berry and its hybrids as well as the Blackberries, but it sounds strange to our ears to include Raspberries under this name. The botany of the Blackberries proper is, if possible, a subject of more heated debate in America than in Europe, and Professor Hedrick's dicta will probably cause discussion in his own country. We should feel it impertinent to intrude here, and it would indeed require frequent cables from America to keep pace with the rapid changes of nomenclature that this long-suffering genus undergoes. As an example, we note that the well-known Lucretia Dewberry is in Professor Hedrick's opinion (1925) "*Rubus flagellaris* var. *roribaccus* of Bailey" (1923), but in Bailey's Cyclopædia (1925) it is *R. procumbens* var. *roribaccus* (late *villosus* var. *roribaccus*). It will be more useful to pass from such controversial matters to the descriptive aspect, and it is interesting to see that our European cut-leaved Blackberry (*R. laciniatus*), so often miscalled American, has escaped from cultivation in the Pacific coast states and is now naturalized there. We are glad to see that the Himalayan origin of the so-called Himalaya Berry is now definitely abandoned and its European origin established as *R. procerus*.

A word of caution, too, may be gained from the renaming of our *R. ulmifolius* var. *inermis* as 'Santa Rosa,' 'Sebastopol,' and 'Covv Thornless,' lest we again welcome a European exile to our shores as a native American.

The section dealing with Raspberries contains some valuable information, and the work of Grubb on British varieties is largely

drawn upon, but the majority described are, of course, of native origin. An interesting point is made that our European *R. Idaeus* is of better flavour than the native *strigosus*, thus adding another to the number of fruits which depend upon the Old World for quality.

The Black Raspberry so far as tested in this country does not attract; the true Raspberry flavour in our opinion is ruined and the Blackberry flavour not approached. The American Blackberries also do not equal ours in flavour so far as they have been tested in this country.

In the descriptions of Red and White Currants the authors do not as in previous volumes give the species from which they are derived, though in many cases it is a very easy matter to ascertain by examination of the flowers. We notice also that the valuable work of Hatton in establishing the nomenclature of the British Black Currants is not referred to—a curious omission.

Gooseberries provide a further interesting case of dependence upon Europe for size and quality, but unfortunately our varieties, as the European grapes, do not survive long under American conditions. The variety 'Chatauqua' figured and described is undoubtedly the English 'Whitesmith.'

The American history of the Strawberry has been traced by many writers, and here again the large-fruited sorts produced first in England have played an important part; but curiously enough our modern varieties are not successful in America, nor, generally speaking, do American varieties thrive here.

The completion of Professor Hedrick's great task provides an opportunity of estimating the value of his work as a whole. First of all as a reference to native varieties it stands alone and is indispensable. The historical essays are valuable and form excellent summaries of existing knowledge. The references to European literature are full and as references accurate. When, however, we come to the more difficult question—is the variety described the same as that referred to? caution must be used.

It is often a most difficult matter to decide—indeed, it is frequently impossible—if a variety described, let us say by French and German writers, sixty years ago, each without standardized systematic descriptions often confined to the fruit alone, is identical with the variety grown under the same name to-day.

Furthermore, a detailed and accurate study of, let us say, the Pear, would be a lifetime's task for any one man to recognize the many thousand fruits which are in existence. Let not, therefore, the sight of these massive volumes deter any youth from venturing into the field of pomological study. The country is discovered, it is not yet conquered. Professor Hedrick and his Generals, like Alexander before him, have opened up the wonders of the East. There is still room for the careful exploration of a limited territory, still need for greater accuracy and a more detailed description, and none would be more ready to admit this than the chief author of these volumes.

In expressing our gratitude we cannot quite avoid the valedictory note, but we believe that Professor Hedrick has already found a new kingdom to conquer, and we leave room therefore on our shelves for further works from his pen. Those who know him personally will make this space an ample one.

"Potato Varieties." By Redcliffe N. Salaman, M.D. Large 8vo. 378 pp. (University Press, Cambridge, 1926.) 25s. net.

Dr. Salaman, as every large potato-grower knows, has devoted the last twenty years to an intensive study of potato problems, and the present work is in large measure a record of these studies. A quotation from the preface is illuminating: "Whilst the presentation of an accurate description of the varieties in use in this country has at all times been before my mind, yet my main task has been the consideration of the forces, inherited and environmental, which control the production of these varieties, their behaviour and their ultimate destiny. . . . Incomplete and imperfect as may be the outcome of these labours, it was evident that sufficient facts had already been acquired to lay the foundation for a systematic study of the subject." Dr. Salaman amply justifies what he set out to do, and his volume is the most valuable and important contribution to the study of the Potato which has appeared in my time or any other time. In all twenty-six chapters are written—Historical Sketch of the Development of Present-day Varieties; Methods of producing New Varieties; The Application of Genetics to Variety Raising; The Classification of Varieties; Yield or Crop and the Genetic Factors affecting the same; Yield or Crop and the Environmental Factors affecting the same; Varietal Differences and their Basis in Chemical and Histological Characters of the Tuber; Varietal Resistance to Disease; Degenerative Causes; Synonymity; The Leaf Index; Varietal Descriptions; Description of Varieties with their History and Synonyms. This last chapter occupies over one hundred pages, and in itself makes the work almost indispensable to every large grower and merchant. The chapter "The Application of Genetics to Variety Raising" is a fascinating one. We are told there are at least four types of immunes to Wart disease: (a) pure immunes; (b) immunes which on selfing give 15 immunes to 1 susceptible; (c) which give 3 immunes to 1 susceptible; (d) which give 9 immunes to 7 susceptibles. Then, coming to susceptible varieties, "Under certain conditions, viz. when the plant is heterozygous (*i.e.* impure) for the inhibiting factor, a susceptible plant, when selfed, will yield proportions as high as 43 per cent. of immune plants." This very important fact is best illustrated by the behaviour of such varieties as 'Myatt's Ashleaf' and 'President,' both of which are capable of giving rise to a large percentage of immune plants, when selfed or when crossed either with an immune or with a susceptible mate. It was similar evidence to this that I once advanced in the Press when the synonymity "stunt" started, and raisers who had named seedlings in good faith which were similar to existing named

varieties were "suspect." The raiser, for example, of 'Midlothian Early' is personally known to me, and I would never doubt his word that it was a true seedling, any more than I would doubt my own work when I raised a synonym to 'Duke of York' from selfed seed of 'Myatt's Ashleaf.' All will agree with Dr. Salaman when he says: "More vital to the public to-day is the production of first-class varieties which will hold their own against Leaf Roll and Mosaic and the like. It is research work in this department which is so urgently called for. It is noteworthy that 'Golden Wonder' (the best quality potato in existence to-day) is resistant to Leaf Roll but chronically infected with Mosaic." Its fault is small cropping, five or six tons to the acre, but I have never been able to understand how it gives, as I have seen it do, nine to ten tons pretty regularly in Lancashire. I conclude by quoting the following words from Chapter XII. in support of the urgency of research work. I am in complete agreement with our author, and I wish every public man could be made to realize it.

"The problem of virus disease meets us to-day at every turn, but in no other direction with such force as in this matter of the yield of the potato crop, and thus the virus diseases, by directly threatening one of the most important elements of the food of the people, becomes a question of national concern, and its investigation a matter which no country can afford to neglect. . . . The Ministry of Agriculture has devoted in all but a few hundred pounds to the elucidation of a disease the ravages of which are costing the country at least five millions annually. . . . Our potato crop is worth on an average at least thirty millions annually and we have no scientific protective force against this insidious enemy."

"Fruit and its Cultivation," By T. W. Sanders. 4th edition. 8vo. 297 pp. (Collingridge, London, 1926.) 7s. 6d. net.

This work, one of the last of its regretted author, has now reached a fourth edition, and opportunity has been taken to meet many of the criticisms made upon the first issue. There are still, however, a few points which any future revisers might consider. The self-fertility or sterility of all Apples described is given, including the latest novelties. Is there sound evidence for all of these decisions? If so, it has not been made public before. The variety 'Summer Golden Pippin' is in season much before 'Yellow Ingestrie.' 'Hoary Morning' is called a Somersetshire Apple, but it is doubtful, as under its French name 'Suisse' and its German one 'Morgendust' it has long been cultivated in these countries. The names of the raisers and introducers of the Veitch Berry have been transposed in error. In the Cherries no indication is given in the descriptions of the very different flavour and texture of the Duke Cherries compared with the Bigarreux. We will not, however, go through the pages in detail, as, subject to such necessary corrections, the book is an excellent guide for the beginner, and with nearly 300 pages, 116 text figures, and 12 coloured plates it is wonderful value for the price of 7s. 6d.

"Heredity." By J. Arthur Thomson. 5th edition. 8vo. 542 pp. (Murray, London, 1926.) 21s. net.

This work was reviewed in these pages on its first appearance, as, though not of real horticultural interest, certain expositions, such as that of Mendel's discoveries or the discussion on the transmission of acquired characters, are of interest and value to horticulturists. In regard to the second subject the author points out that even our daily conduct is affected by our opinions on this subject. It will be remembered that female-suffrage adherents often argued that male superiority (if any) was due to the better education the men had received

for generations, and the unspoken assumption was that the effect was cumulative. Another class of thinkers often assume that they owe certain disabilities to their port-loving ancestors. Gardeners often state that the increasing size of flowers, fruit and vegetables is the cumulative effect of cultivation. A reading of Professor Thomson's Chapter VII by such protagonists is, though unlikely, eminently desirable. The get-up of the book, paper, type, and illustrations are excellent.

"Violet Culture for Pleasure and Profit." By Frederick E. Dillistone, F.R.H.S. 8vo. 32 pp. (Benn, London, 1926.) 2s. net.

This booklet deals with the soil and situation best suited to violet cultivation, the importance of water-supply, propagation and cultivation, the insect and fungus pests that affect *Viola odorata*, with advice on how to pick and market the blooms, and finally a chapter on average expenses and profits. As this matter is compressed into only 20 of its 32 pages, the treatment is necessarily brief. Removal of runners is only referred to in connexion with propagation, and nothing is said of the removal of cleistogamous buds. Yet, as it is the cultivator's object to concentrate all growth upon the perfect blossoms, this is of importance, especially for the autumn flowering. The time estimate—September to May—is a cautious one. Violets can be, and have been, secured continuously from August to June, ten months, and that in places as diverse as Sussex and Herefordshire.

"A Simple Guide to Rock Gardening." By Sir James L. Cotter, Bt. 8vo. 126 pp. (Sheldon Press, London, 1926.) 2s. 6d.

In his preface to this book the author states that he wrote it "at the instigation of many readers of my previous writings on this subject."

The literary style is not perhaps more melancholy than that of masses of other garden books which have happened in recent years, though one cannot forgive pages which are thickly strewn with that dreadful word "Rockery."

There are seven little chapters dealing with "How to make Rockeries," "Types of Rockeries"—of which the "cone-shaped Rockery" is one—and kindred subjects.

The author recommends that the rocks used should be as square as possible, and that they should lie from the top to the bottom of the rockery as if originally thrown there by some prehistoric avalanche; but he rightly insists that the rocks should be placed firmly. He adds: "A sound test which I always made, to ensure safety in this respect, was to make two heavy workmen stand on the stone when it had been planted, and endeavour by moving to cause it to shift. If they failed, the rocks were considered safe." One cannot help wishing that Mr. George Morrow had illustrated "A Simple Guide to Rock Gardening."

Chapters 8 to 15 deal with a few of the chief families of alpine, Androsace, Anemone, Campanula, Dianthus, Gentian, Phlox, Primula, and Saxifrage. On studying these chapters one is chiefly impressed by the profound superficiality and inaccuracy of the information given. Almost consistently throughout, species are referred to as "varieties," and every Latin specific name is given a capital. *Douglasia Vitaliana* is said to carry its flowers on 3-inch stems. *Anemone Blanda Alba* is said to be a "charming white variety of the foregoing"—the foregoing being *Anemone Baldensis*.

Anemone Nemorosa Robinsoniana is described as having flowers in varying shades of blue, rose, and purple. *Anemone Vernalis*, the author says, he grew in his Bog Garden, whilst *Juniperus Hibernica Compressa* is described as of prostrate habit.

This sort of thing runs from end to end of the book, and the spelling is more than careless.

We cannot but regret that the "many readers" at whose instigation this book was written were a little less insistent or that the author did not steel himself against their blandishments.

"Cotton and Its Production." By W. H. Johnson, with an introduction by Sir Wyndham Dunstan and a foreword by Sir William Himbury. 8vo. 536 pp., 26 maps. (Macmillan, London, 1926.) 30s. net.

This book is an important contribution to the literature on cotton, presenting as it does, in a convenient form, a résumé of the present position of cotton cultivation in all countries of the world where this crop is grown. Amongst world crops cotton now occupies an important place, and the produce of its cultivation supplies the raw material for the most valuable manufacturing industry in this country; whilst cotton-seed, as a by-product, furnishes edible and other oils as well as valuable feeding-cakes and fertilizers. These secondary cotton products

give to the cotton crop a high position as a food crop quite apart from the value of its main product for industrial purposes.

Although the United States is the leading cotton-producing country, it is satisfactory to learn that most of the British overseas countries within the cotton belt either produce cotton or are conducting cultivation trials which may ultimately establish them as cotton-producers. In this experimental work great assistance has been afforded during the past quarter of a century by the British Cotton Growing Association. A short account of the activities of this Association forms the subject of the foreword which Sir William Himbury, the Managing Director of the Association, contributes to the work.

There are now efficient Departments of Agriculture in the Colonies and Protectorates to carry on the good work initiated by the Association. Although the author gives a lengthy bibliography of works on cotton and acknowledges his indebtedness to leading authorities on the subject, he has himself had considerable experience of the cultivation of cotton, having been formerly Director of Agriculture in the Gold Coast, the territories of the Mozambique Company, Portuguese East Africa, and in Southern Nigeria, and also lately adviser to the Australian Cotton Growing Association. He therefore writes with a good deal of first-hand knowledge of his subject. The greater part of the work is given to the description of cotton production in the various countries concerned. In the case of a country having an established cotton industry the methods of cultivation are described and statistics of production furnished, together with an account of the peculiarities and value of the cotton produced. In the case of countries where the cotton cultivation is in the experimental stage, the position is discussed and results and possibilities are summarized. There is an outline map for each country or group of countries dealt with, on which the cotton areas are indicated by an overprint of green. Both producers and users of cotton should find this work very useful, whilst to the student of tropical agriculture as well as to the general reader it should prove a mine of information.

"A Practical Handbook on Rat Destruction." By C. Leopold Claremont, B.Sc., F.I.C. 8vo. 180 pp. (John Hart, London, 1926.) 3s. 6d. net.

Much has been written on the rat nuisance and means for its abatement. There is room, however, for such a book as this, which treats the subject in such a plain and practical manner. The different species and varieties of rat and their respective habits are ably dealt with in Chapter II. Methods of hunting, trapping, and gassing are fully described. An excellent account of rat poisons and their use, co-operation in working according to the Rat Destruction Act, and the influence of rats and their parasites on public health occupy other chapters. A good index ensures quick and easy reference.

"Life of Plants." By Sir Frederick Keeble, F.R.S. 8vo. xii + 256 pp. (Clarendon Press, Oxford, 1926.) 5s. net.

As is only to be expected, Sir Frederick Keeble has achieved an excellent story of the life of plants, remarkable in the clearness with which it surveys the main facts of plant growth and response to its surroundings. This clearness has been attained not by any sacrifice of accuracy, glossing over difficulties, nor, indeed, by any abrogation of technical terms which science has found necessary for the expression of new ideas, but largely by an appeal to facts of everyday knowledge and by happy allusions.

The ordinary intelligent reader will enjoy reading it if he wishes to learn something of the active life of the apparently immobile vegetation around him; the young student will be able to obtain from it a clearer idea of the changes that occur so often unseen and unsuspected, minute by minute, in the silent world of plants; and the teacher will be repaid his perusal of it by many an illuminating suggestion and method of attack upon problems which are often found difficult to state lucidly. To all of these we commend it.

"Plant Products." By S. Hoare Collins and G. Redington. Ed. 2. xiii + 262 pp. 8vo. (Baillière, Tindall & Cox, London, 1926.) 10s. 6d. net.

Considerable changes have been made in this useful book since its first issue during the war, but, as with that, the title does not adequately indicate the contents.

One would scarcely expect to find a clear and concise account of manures and soils and their treatment under such a title, yet we have it here, and little more than half the book actually deals with plant products: much less than half, indeed, if we omit the chapter headed "Photosynthesis" (pp. 111-152).

That chapter, however, steps far outside the bounds of photosynthesis itself and deals with all sorts of generalities concerning plant contents, useful and apt to what follows, but not strictly belonging under the title "Photosynthesis."

The actual matter of the title is therefore restricted to pp. 153-221, and seventy pages is all too short if, as for instance under "Sugar," notes upon the cultivation of the sugar-cane in various parts of the world are included. The last part of the book deals with plants as food for beasts.

Much has therefore been attempted under a restricted title, and the student will need to pursue his subject outside the covers of the book if he wishes to obtain an accurate and useful knowledge of any one plant, and this the authors recognize, for fairly full (but not always very accurately quoted) bibliographies are given. The index entries, consisting of single words for the most part, occupy ten pages in double columns out of the 262, and this gives an indication of the multitude of matters the authors have briefly touched upon.

"Eve's Garden: The Cultivation of Carnations, Chrysanthemums, Bulbs, Roses and Flowers grown in the Open." By L. E. Fox. With a Prefatory Note by J. Fraser, F.L.S., V.M.H. 8vo. 104 pp. (Longmans, Green & Co., London, 1925.) 2s. 6d.

The first 46 pages deal with general applications, the following pages with cultural notes on various flowers, namely, annuals, sweet peas, poppies, biennials, some perennials, anemones, begonias, ranunculi, some tuberous plants, irises, bulbs grown in the open air and in bowls, pots, or glasses, some long-lived perennials, carnations, chrysanthemums, roses, some climbing plants, some flowering shrubs, some flowering trees, grass and lawns. Mr. Fraser's final words in his prefatory note are: "Those who thoroughly master the contents of this book and put them into practice correctly will have made a considerable advance in the knowledge of gardening."

"Aims and Methods in the Study of Vegetation." Edited by A. G. Tansley and F. F. Chipp. 8vo. xvi + 383 pp. 62 illustrations. (British Empire Vegetation Committee; Crown Agents for Colonies. London, 1926.) 12s. 6d.

The Imperial Botanical Conference held in London in July 1924, amongst its other activities, set up a committee of five members, the British Empire Vegetation Committee, and the present work is the result, the editors being the Chairman and Secretary respectively.

The best way to show the plan of the book will be to give the following extract from the preface:—

"The plan adopted in Part I. is to begin with a general statement of the nature and aims of the study of vegetation; next, to give an outline account of the best way to analyse vegetation into units which can be conveniently dealt with, and to describe the methods which may be adopted in actual study of particular examples; then to describe and suggest practical methods of study of the main groups of factors which mould vegetation: finally, to add two or three articles by specialists on certain groups of lower plants which require special methods of study. Parts II. and III. consist of a number of chapters by expert workers in the field overseas whose assistance the editors have been fortunate enough to enlist. These will enable the student to learn, at first hand so to speak, the views of some of the most successful workers in the Empire as to the equipment and methods of work which they have found most useful in the field."

This volume is packed with facts, and demands and deserves attentive reading, and to do justice to the book would need a long notice, which the space at our disposal forbids. We can only recommend a close study of every page.

"Carnations for Amateurs." By L. J. Gibson. 8vo. 130 pp. (Collingridge, London, 1926.) 5s. net.

Carnation-lovers ought not to be at a loss in their attempts to grow them, for books upon this favourite multiply, and if books alone would suffice we should see fewer weak and struggling specimens in the greenhouses of the country than we do to-day. To all we commend the statements so clearly made on p. 78, e.g. "To be at its best it (the winter-flowering Carnation) demands a house to itself." Its demands for ample ventilation, good light, fairly high temperature, dry air, thorough drainage, and ample moisture at the proper time are such that it "makes but a poor room-mate with other plants." We quote these remarks because it requires some courage on the part of an enthusiast such as the author to give such warnings and in a sense to discourage cultivators with small houses from attempting to grow flowers which are such general favourites.

But although the book is entitled "Carnations" it is not restricted to that group of flowers, for there is a good amount upon the alpine and border pinks as well. The old pink of our grandmothers' gardens has passed somewhat into neglect, but we shall doubtless see a revival of the cultivation of this as of other old-fashioned plants, and the hints given will prove very useful to those who wish to excel with them. The hybrid pinks raised by Messrs. Allwood are, of course, well known and distinct from most pinks in habit. More conformable to the ideals of the old florist are the Douglas pinks, which, like the extremely fine varieties raised by Mr. Herbert, are true pinks without the mixture of any other species. It seems a pity, by the way, to call the latter *Herbertii* Pinks—we think Mr. Herbert would not approve of the name and that Herbert's (printed "Herberts'" in this book) strain is a designation far to be preferred.

The chapter on diseases and pests will need a little revision to bring it up to date and so as to include the worst trouble of Carnations under glass—Carnation stem-rot—and the excellent new treatment with naphthalene against red spider.

We confidently recommend this book to all seeking a guide to the cultivation of all types of Carnation and Pink.

"A Handbook of Flowering Trees and Shrubs." By R. C. Notcutt. 8vo. 246 pp. (Martin Hopkinson & Co., London, 1926.) 12s. 6d. net.

The scope of this book is severely limited, for it deals fully with only a dozen or so important genera, mostly shrubs. Nothing is to be found about *Rhododendrons*, *Azaleas*, *Heaths*, *Magnolias*, *Spiraeas*, *Philadelphuses* or *Lilacs*, not to mention numerous small genera of one to ten species. Nor, except for *Prunus* and *Pyrus*, do we find many genera of trees even mentioned. This, however, is the only adverse criticism we have to make, and in a sense it is an expression of a desire for more. Possibly the intention is to supplement the present volume by additional ones. It is excellently written, the descriptions although brief and without much detail give a general idea of the species or variety they deal with, the illustrations are wisely chosen and admirably reproduced, and the type is good and clear. The cultural directions, as might be expected from the author's long experience, are extremely useful.

Mr. Notcutt devotes some fifty pages of his book to "Seaside Planting," and they constitute an extremely valuable feature. No one in this country has had more experience in this type of planting, or is better qualified to write upon it. Anyone with a seaside garden and desirous of furnishing it in the best way will find this chapter alone worth the price of the book. In this section, too, a considerable number of species adapted for maritime places are described, and this, of course, adds to its scope. A word of praise also must be given to the chapter on "*Cistus* and *Helianthemum*" and to that on "*Cytisus* and *Genista*"; for some years past Mr. Notcutt has specialized on these genera, and he has dealt with them here in a comprehensive and authoritative way. Another part of the book that is of particular value is the chapter on "*Japanese Cherries*" by Mr. Collingwood Ingram. Mr. Ingram has now the finest collection of these beautiful flowering trees in Europe and he is the first authority on them in this country.

The proof-sheets have evidently been very carefully read and the spelling of the names is above reproach. There is a little uncertainty and lack of uniformity in the use of capitals or small letters for the initial letter of some specific names, so that we get '*malus*' as well as '*Malus*,' '*Langleyensis*' as well as '*langleyensis*'; but this is a small and unimportant matter.

"Carnations for every Garden and Greenhouse." By Montague C. Allwood. 8vo. 139 pp. ("Country Life," London, 1926.) 12s. 6d. net.

"Comprehensive" is the term that may very aptly be applied to Mr. Allwood's latest book on Carnations.

In tracing the history and development of the more modern types of Carnations—and shall I say Pinks?—he has added interest for those who are not so closely identified with the purely cultural side.

I fear, and indeed know, there are many of us who look upon a book on any particular phase or subject in horticulture purely as a means to an end, i.e. the better knowledge of the subject from a cultivator's point of view, thereby hoping to grow the plants better: the "amateur" for the sheer or pure love of growing things well; the "exhibitor," whose one object is to produce bloom to beat his fellow competitors; and those of us with more mercenary motives, whose object is to produce bloom that will make more money in the market, and incidentally help brighten the homes of thousands who are not able to indulge in the joys, and sometimes sorrows, of plant cultivation. To all of these Mr. Allwood's

book must very strongly appeal, and though, when one takes it up first, he is apt to think (by the size of it) that the author must have thoroughly well padded or written round the subject, there is hardly a sentence that he might well have left out—in fact, in reading it myself I feel that he might well have added even very much more without making it tiring reading.

In tracing the development of the Perpetual-flowering Carnation, I missed the name of the variety 'John Peter Rugus.' This, though not too free, was very fine in colour (richest scarlet) and was being grown about 1894 or 1895.

Another variety I had hoped to note was 'Madam A. Warocque,' which, if my memory serves me right, was a small scarlet Malmaison, which was very successfully cultivated for winter blooming by Mr. W. Mease, Downside, Leatherhead, and, of course, others.

'Madam Therese Franco,' though mentioned, is not made quite enough of; it was a fine growing variety which, with proper manipulation, would give a heavy crop of blooms during the autumn and winter, and a variety which will do this is far better than those that give at least two-thirds of their crop during the summer and early autumn.

Mr. Allwood's remarks on the selection of cuttings are Good, with a capital G, though I would not go so far as to corroborate that to some extent split calyx could be prevented in this way; if it would do so, then all the time and trouble expended on it would be more than compensated for.

The chapter on propagating is good, but I could have stressed even more the evils of allowing the sand in the propagating houses or frames to become dry, and I would like to give air before the temperature rises to 65° F.

Instead of the chapter on *The Time to House Perpetual Carnations*, I think I should have just stated that to ensure the very best results, Perpetual Carnations should at no period of their existence be grown out of doors. To this I suspect Mr. Allwood would agree, and I too realize there are hundreds of growers who must put them out for want of space, hence his chapter on the best alternative system.

Further on, in the chapter on Insect Pests, relating to Red Spider, I really expected him to recommend naphthalene fumigation—true, it is dangerous to recommend anything for killing insects that has not passed the experimental stage, and much harm is done thereby, but the above-mentioned fumigant in careful and capable hands spells death to red spider.

Also I would have preferred to find all the chapters dealing with Perpetual-flowering Carnations following one another.

Apart from these few criticisms, I have had considerable pleasure in reading this book, and few, I think, could go through it carefully without feeling that Mr. Allwood had dealt with the subject on sound and broad lines, and even the cleverest should be able to add some bit more to his or her store of knowledge of a very interesting subject.

"A Text-Book of Organic Chemistry: Historical, Structural and Economic."
By John Read, M.A., Ph.D., B.Sc. Crown 8vo. xii + 680 pp. 12s. 6d. net.

The aim of this book is not quite the same as that of the majority of text-books; it is, indeed, somewhat unusual, and for that reason alone merits close attention. In Professor Read's words, "May the time be near at hand when our universities and colleges come to be regarded by their *alumni* less as 'seats of learning' and more as 'abodes of understanding,'" and by writing such a book the author has indicated very clearly how this desirable state may be brought about. To be of value to a reader, be he student or otherwise, a text-book, apart from being logical in method and accurate as to details, must be well written and in simple language: one of the great merits of the present work is its clear style and fine English. Professor Read has introduced with telling force historical matter of the greatest interest and importance. Thus, in the very heart of the book, on the subject of Stereochemistry, is to be found Pasteur's own account of his resolution of racemic acid and, more fascinating still, his report of the examination to which he was subjected by Biot on his classical discovery. Numerous other instances are quoted in which the crucial experiments leading to an important advance are given in the original words of the investigator.

To the botanist and horticulturist, those parts of the book dealing with natural products are, perhaps, the most attractive, particularly those of economic value; and the world's trade in the more important of these bodies is briefly analyzed, with particular reference to the resources of the British Empire, e.g. cotton and dyes. Thus the student is led on and stimulated both by the academic

work of the older investigators and by the practical problems of the present to which they are intimately related.

The book is well illustrated with clear diagrams of apparatus, some of historical value, and details of practical work are indicated for the preparation and reaction of the more important compounds. Each chapter concludes with useful exercises in the form of questions.

All those interested in the rise, development, and present position of organic chemistry, whether they be students of chemistry or of the other natural sciences, or of the applied biological sciences, will be rewarded by the possession of this work.

"The Forests of India." Vol. iii. By E. P. Stebbing, M.A. 8vo. Illustrated. 705 pp. (John Lane, London, 1926.) £2 2s. net.

Having reviewed the first two volumes of "The Forests of India" at the time of publication, we have waited longingly, but not in vain, for the concluding part of this colossal and comprehensive work, in the compilation of which over seven years have been spent. The whole may well be described as a work of the first national importance, not only as far as the Indian Forest Service is concerned, but to the British colonies as well, as also, indeed, to those who have the management of tropical forests in any part of the world. It is practically impossible in the space at our command to give anything approaching a detailed account of the contents of this standard work, which embraces every phase of the Forestry of India up to and including 1925. The present volume, which is divided into two parts of twenty-three chapters, extends to 689 pages, with upwards of one hundred and fifty carefully chosen and well-executed illustrations, which depict forest scenes and other allied subjects in a clear and forceful manner. Part I contains an account of the progress of forest conservancy in the several Presidencies and Provinces between 1871 and 1900, and Part II the general progress of forest conservancy and the inauguration of forest research work in India and Burma, 1901-25, regarding which a large number of most useful tables is appended. The great increase in revenue from the forests of India since the first introduction of conservancy, now sixty years ago, is well set forth in Chapter XXI, which contains an account of the progress of the yield and revenue from the forests 1901-25, as also tables of figures, in which at a glance can be seen the profits that have accrued under the best system of management. This is in the main due to (1) reorganization of works, (2) increase of staff, and (3) increase of money grants, which latter, however, are still quite inadequate to meet the large and ever-increasing works that have to be carried out. The most notable point in connexion with this steady increase, is the fact that every reorganization of the staff with advanced money grants has been quickly followed by an upward leap in the revenue derived from the forests. The record of the Forest Department during the great war, 1914-19, is of the greatest interest, and is fully dealt with in Chapter XIX. Here it is well said that when the enormous demands in timber and other forest produce required by the military authorities to carry on the war became apparent, a very large amount of urgent and additional work was demanded from the personnel of the Department, and several Provinces were called upon to play an exceedingly heavy and quite unforeseen part in the war. In the winter of 1917-18 the demand for timber for aeroplane work became urgent, and in connexion with this it is of interest to learn that an expert officer of the Munitions Board visited the spruce and silver-fir forests in order to test the timbers. It was, however, eventually decided to obtain the timbers from other sources, as the spruce and silver-fir were found to be not exceptionally well suited for the purpose, while the difficulties of extraction were very great. Walnut for propeller blades was also cut for experiment in the manufacture of these, but it was found that the Himalayan walnut when cut green developed a tendency to split, which made it unsuitable for the work. Regarding the training of the probationers for the Indian Forest Department (Chapter XIII) there is much of particular interest to be learnt, and it is shown that considerable difference of opinion had existed on the subject from time to time. The Government of India and the Secretary of State had evidently not always seen eye to eye in this important matter, and had not been in agreement over the inauguration of the training under Schlich at Coopers Hill, the Government of India expressing the desire to continue the education on the Continent as had been the case for a number of years. Under the supervision of Schlich, however, the training at Coopers Hill, based as it was on a previous public competitive examination, soon proved its value, and during the period for which it lasted (twenty years) many good officers entered and passed successfully through the service. To the great work carried out by

the first three Inspectors-General, who were of German nationality, unstinted praise must be given, for they not only brought the Department into being but established a valuable Forest Administration in the country. The inauguration of the magnificent research station at Dehra Dun has been attended by the most promising results and was certainly a step in the right direction that had been much too long delayed. Soon after the inauguration of the Institute a definite programme of work was drawn up, including a Sylvicultural Branch, Economic Branch, timber testing and seasoning, wood preservation, as also a paper-pulp section and that on minor forest produce, all of which have been found of the greatest value in the education of the Forest Officers. The exploitation of the valuable teak forests has had a commencement, in the working of which thoroughly up-to-date mechanical and other power is being fully utilized with most satisfactory financial results. In concluding the present volume, Professor Stebbing truly says that "As a result of my study of the present position of forestry in India I have definitely made the statement that in some respects and in some districts India can show as good and efficient examples of forest management as are to be found in those European countries famed for their scientific forest conservancy. In a country so extensive, where its forest department is responsible for areas of a size no forest department has ever before attempted to scientifically conserve, the Forest Officer is only at the commencement of a gigantic task."

The author is to be heartily congratulated on the exhaustive record that he has got together in these three volumes, in which will be found an immense body of material that has never been equalled by that in any other country. The work has been colossal and is a veritable mine of information on the Forests of India.

"The Plant Lice or Aphididae of Great Britain." By F. V. Theobald. ix + 372 pp. (Headley Bros., Ashford and London, 1926). 25s. net.

This book, which comprises the first of three volumes, deals with the British species of Aphides (exclusive of the Phylloxeridae) and is illustrated with 196 text figures. Since the publication of Buckton's monograph on the group, there have been numerous new species recorded and described in various entomological publications, and the author has brought the matter up to date. In the introduction there is a detailed description of the external anatomy of an aphid, the general characters of the Aphididae, their natural enemies (insects, birds, and fungi), the normal life cycle, and abnormal growths produced by plant lice.

Keys are given for the sub-families, tribes, sub-tribes, genera, and species. A full description, with figures of structural details, is given of each species, together with food-plants, localities, natural enemies, synonymy, and general observations, which include a brief account of the life-history and economic importance.

The monograph will be welcomed not only by specialists in the group but by economic entomologists, horticultural advisers, and agriculturists and horticulturists generally.

"Plant Pests and Diseases." By H. H. Aitken and H. H. Thomas. 120 pp. (Cassell, London, 1926.) 1s. 6d. net.

The volume is in two parts: Part I is devoted to insect and other pests, and Part II to fungus diseases of hardy fruits and flowers, vegetables, and greenhouse plants. Each part is subdivided into chapters dealing with the pests and diseases of particular plants arranged alphabetically. Further chapters are devoted to beneficial insects and animals, weed-killers, insecticides, and soil fumigants, fungicides, and spraying.

This book is written in a clear and concise manner and illustrated by numerous sketches of insects and other pests, fungus diseases, and remedial measures. A very complete index is an asset to a work of this description.

"Practical Spraying." By J. W. Morton. 48 pp. (Benn Ltd., London, 1926.) 2s. 6d. net.

This small handbook is one of a series of practical manuals for market growers, and deals with the spraying of fruit-trees, potatoes, corn, and hops against insect pests and fungus diseases. Chapters are devoted to the various types of spraying machinery, grease banding, and a review of the more important pests and diseases of fruit crops.

A serious omission is the failure to recommend the use of tar-distillate washes against aphid eggs, although the author remarks that these washes are useful in killing the eggs of certain caterpillars (*sic*) and apple-sucker (p. 13). A great

wastage of material would ensue if a grower sprayed his apple and pear trees with nicotine soap in March against apple-blossom weevil and pear midge (p. 20). On p. 22 we find *Quassia* spelt three times as "Quassi," and in addition there is no formula given for either *Quassia* wash or paraffin emulsion. It is hoped that the author's optimism will be realized when he advocates using a nicotine spray against "red spider" (p. 39). Again, on p. 13 we read that tar-distillate washes are effective in destroying the ova of apple-sucker, but on p. 44 the only remedy suggested for this pest is a thorough spraying of the opening buds with lime-wash.

"Garden Talks." By Marion Cran. 8vo. 179 pp. (Methuen, London, 1925.) 5s. net.

There are twenty-three chapters in this book, the headings of which are as follows:—1, Primroses; 2, The Dolphin Flowers; 3, Wind-flowers and Water-lilies; 4, Rock Gardens and Sink Gardens; 5, Pretty Things in Corsets; 6, The Formal Garden and the Sentimental Path; 7, "The Way of Thy Feet"; 8, The Clockface of the Lanes, and Gardeners' Hands; 9, Carnations and Border Pinks; 10, Hedges; 11, Roses; 12, More About Roses; 13, Fruit Trees; 14, Currants and Berries; 15, Herbs; 16, Starworts, Chrysanthemums and Hollyhocks; 17, Pests and Manures and Spraying; 18, The Winter Garden; 19, Potatoes and Elders; 20, Letters from the Void; 21, Mistletoe and Lawns; 22, Dahlias and Irises; 23, The Peasant Woman's Garden.

"How to Grow Series." 1, "Roses"; 2, "Pansies, Violas and Violets"; 3, "Simple Flowers from Seed"; 4, "Dahlias and Border Flowers"; 5, "Sweet Peas"; 6, "Carnations and Pinks." All by Walter Brett, F.R.H.S. 8vo. 64 pp. in each. (Newnes, London, no date (1926 ?).) 1s. each; by post, 1s. 2d. each.

These books contain simple directions for the cultivation of the plants included under their titles.

"The English Flower Garden." By W. Robinson. 14th edition. 8vo. 710 pp. (Murray, London, 1926.) 24s. net.

Every gardener knows this work, the first edition of which was published in 1883, and the 14th has now appeared, revised and written up to date, and with the same delightful old wood engravings familiar to every gardener—for surely every gardener must possess at least one copy of this indispensable work. Some of the old chapters have been amplified and others abridged. They are all good reading, but one cannot help regretting that the years have not softened the prejudices which undoubtedly exist to too great an extent in the mind of the author, because the impression is conveyed that nothing is right in gardens outside his own very beautiful garden at Gravetye.

Formal and Sunk Gardens, Dutch and Italian Gardens, "one-colour gardens" and "bedding out" are all condemned as bad. The clipping of Yew and Box, the use of Latin names instead of English ones, all come under his ban.

According to him the clipping of the Yew is a deadly sin, and although this can certainly be overdone, few will deny that a good Yew hedge is a beautiful object in a garden and forms the best possible background for flowers. After all, if the Yew is not to be clipped, why should he tolerate Box edgings, which require clipping, or, for the matter of that, why should the lawn be mown?

The lists of flowers in the various beds of his own garden given in Chapter IV are good and helpful to the young gardener, but some of the English names used are somewhat puzzling, and one wonders how many gardeners would know the following: Californian Fuchsia, Shamrock Pea, Blue Bindweed, Prairie Primrose, Chinese Meadow Rue, Sand Pink, Gauze Plant, Narbon Flax (why not Narbonne?), Snow Glories (why not Glory of the Snow, which is the well-known name of *Chionodoxa*?), Horned Violet, Sword Lilies, Horse Briar, Baby Blue Eyes (a charming name, but what is it?).

On the other hand, why *Delphinium* instead of the well-known English name of Larkspur, and why *Lil. regale* instead of Royal Lily?

That fully half of several thousand roses worked on Briar stock should have died can hardly have been due entirely to bad luck, for if this were anything like the usual percentage of deaths the seedling Briar would surely not be as much used as it is. The author's method of growing roses on their own roots without manure and pruned in autumn instead of spring is certainly unusual, as is the surfacing of the beds with Saxifrages and other dwarf plants in place of a mulch. These grown in rich rose soil would be very likely to smother the roses, certainly, we should think, Evening Primrose (except, perhaps, *missouriensis*), Geranium, and

Mignonette would ; but in any case they would probably want replanting every year, which is equivalent to "bedding out."

The Clematis does notoriously well at Gravetye, and we agree with the author that layered plants are in every way preferable to grafted ones, though even with plants on their own roots one cannot be sure that apparently healthy plants will not suddenly collapse in that mysterious way that Clematis plants have.

The lists of hardy plants and shrubs given at the end of some of the chapters are in every way excellent and helpful both to the beginner and the advanced gardener. We should like to have seen a list of autumn-colouring trees and shrubs as well.

In Chapter VIII the author gives a description and plan of his own garden, which is exactly what a garden attached to a beautiful old house should be, laid out with simple rectangular beds "full of sweet flowers and daintiest delights," "Carnation, Lily; Lily, Rose," all more or less permanent plants rather than bedding-out, the paths laid with plain stone slabs which are far more restful and dignified than the "crazy" paving which, unfortunately, is so fashionable nowadays. No one could have done it better, not even the architect of the house, but one wonders why the owner of this garden should object to its being called "Formal" by the young lady visitor. It evidently rankles, as the episode is mentioned in two different places in the book. Formal it certainly is, as the plan shows, and none the worse for that.

Part II of the book is, as before, devoted to Flowers, Trees, Flowering Shrubs, Evergreens, and Hardy Ferns for the open-air Flower Garden in the British Isles. It contains practically everything which can be grown in our gardens, and on the whole it has been brought pretty well up to date. The author has wisely not attempted to describe too large a number of those large families of Berberis, Cotoneaster, and Rhododendron, but most of the best varieties are given. In writing of Rhododendrons he lays stress on the danger of overplanting these beautiful shrubs. They are so popular that some gardeners are apt to grow them to the exclusion of other good things.

The Primula family is now so large it is impossible to bring them all into a book of this description, but here, again, quite a good list is made out. Meconopsis may be said to be quite up to date, though the beautiful Baileyi variety is not included.

The last edition of this book is certainly superior to its predecessors, which should be sufficient to commend it to all garden-lovers.

NOTES AND ABSTRACTS.

[For Index of Periodicals quoted see previous volumes.]

Aphis rumicis (Linn), **Biological Studies of Factors affecting the Infestation of Vicia Faba with A. rumicis.** By J. Davidson (*Ann. App. Biol.* vol. xii. No. 4, Nov. 1925, pp. 472-507; 5 figs.).—An investigation as to the influence of various factors, e.g. temperature, manurial treatment, soil conditions, age and variety of plants on the degree of infestation of broad beans by the aphid. *Aphis rumicis* Linn.

The variety 'Prolific Longpod' was used, it having been previously discovered to be highly susceptible to this pest.

Detailed descriptions are given as to the various factors used in the experiments and the origin of the biological strains of the aphides.

It was found that plants grown in soil treated with complete mineral manures became slightly more susceptible to attack than those grown in unmanured soil, also that an increased potash content in the soil had a bearing on increased infestation. By reducing the light, the infestation decreased, and the same result was obtained by subjecting plants to artificial light during the winter months, when such plants became infested to a greater degree than the controls.

Bean plants six weeks older than the controls gave a marked decrease in infestation figures.

An important bearing on outbreaks of aphid attacks is the connexion between optimum temperature for the growth of the plant and that for the development and reproduction of the aphides. Aphides react to physiological changes in the host-plants which affect, through the food factor, the progress of infestation.

The results are summarized in a series of tables and graphs. Figure 3 shows a diagrammatic section through the head of *A. rumicis* and the method in which the plant's food-supply is tapped in the phloem.—G. F. W.

Apple Black Spot. By W. A. Birmingham and H. A. Mills (*Agr. Gaz. N.S.W.* vol. xxxvi. pp. 665, 666).—The Black Spot of Apples is due to the fungus *Venturia inaequalis*. The best antidote is to spray with Bordeaux Mixture between early spur-burst and pink stages, and again at the calyx stage.—S. E. W.

Apple Capsid Bug, Experiments on the Control of the. By L. N. Staniland (*Jour. Pomology*, vol. v. No. 4, October 1926, pp. 267-274).—The apple capsid (*Plesiocoris rugicollis* Fieb) is an important pest in the Bristol Province, and measures for remedying the pest have been carried out at Cheltenham and elsewhere.

Several brands of tar-distillate washes were tested, and considerable ovicidal action was exercised by certain of them when used at 8 per cent. and 10 per cent. strengths.

It was found that an efficient method of controlling this pest is winter-washing with an approved tar-distillate wash, followed by an oil-spray or nicotine-soap wash in spring.—G. F. W.

Apples, Water Core of. By Charles Brookes and D. F. Fisher (*U.S. Jour. Agr. Res.*, vol. xxxii. No. 3, Feb. 1926, pp. 223-260).—Water core in apples is found in all apple-growing districts, but is prevalent in arid regions where irrigation is necessary and where intense sunlight prevails. Many of the best varieties are susceptible, and these include Jonathan, Wine Sap, Delicious, Pound Sweet, Yellow Transparent, Fall Pippin, and others.

Apples attacked by this disease present a watery or glassy appearance in their flesh. Sometimes the whole apple is involved, but more frequently only the core and the vascular tissues adjacent to it are involved. It appears chiefly in mature apples.

Irrigation experiments extending over six years show that apples from lightly irrigated trees developed more water core than apples from heavily irrigated trees. An excess of soil moisture late in the season showed no tendency to increase the amount of water core. Apples from trees receiving nitrate or potash fertilizers usually had less water core than those from untreated trees. Large apples were more susceptible than smaller ones to water core. Apples exposed to strong sunlight were particularly susceptible. A close relationship exists between sap concentration and water core. Heavy irrigation tends to decrease both sap concentration and water core. Exposed and sunburnt apples have a high concentration of sap and water core, and this increases with the maturity of the apples. Such apples have a lower acidity than normal apples.

Water core is apparently the result of sap exudation under pressure, and the present evidence seems to point to high sap concentration as a precursor of the disease. The authors hold that this cause, not variation in rainfall or soil moisture, is one of the chief factors in causing the disease of water core.

A short bibliography is added.—A. B.

Arbor Day, its Purpose and Observance. By Lewis C. Everard (*U.S. Dep. Agr., Washington*, March 1926; illustrated).—All over the United States, Arbor Day has become associated with patriotic and aesthetic as well as economic ideas. It is at once a means of doing practical good to the community and an incentive to civic betterment. Closely associated with Arbor Day in its patriotic purposes is the recently established custom of celebrating American Forest Week. Each year a week in the latter part of April is set aside by Presidential proclamation for consideration of the benefits of our forests and their care and improvement and protection from fire, for tree-planting, for the devising of economies in the preparation and use of forest products, and for encouraging the perpetual forestation of our forest lands.—A. D. W.

Aspen in the Central Rocky Mountain Regions. By Frederick S. Baker (*U.S. Dep. Agr., Washington*, 1925; illustrated).—Aspen (*Populus tremuloides*) is the most widely distributed broad-leaf tree of North America. The best development is on rich, deep-soiled flats supplied with plentiful moisture. The timber is especially suited for the manufacture of paper-pulp, match-splints, and excelsior. The future use of the Aspen of the Rocky Mountains regions is difficult to forecast, but the general opinion is that it will be extensively used for the special purposes for which it has been found so well adapted. Large numbers of match-splints are being made of the wood, quantities of which are being exported to this country, a business that is quite likely to greatly expand.—A. D. W.

Autumn Tints. By C. Leray (*Rev. Hort.*, 1925, pp. 414-417; 1 col. plate).—The following shrubs are recommended for the brilliance of their autumn foliage. Various forms of *Acer*, particularly *A. Ginnala* and *A. Burserianum* for the rich bright-red coloured foliage. *Amelanchier canadensis*, *Asimina triloba*, all varieties of *Berberis*, especially *B. angulizans*, *B. Wilsonae*, *B. polyantha*, *B. aggregata*, *B. acuminata*, and *B. aemulans*. *Callicarpa Givaldiana*, *Carya alba* and *tomentosa*, *Cercidiphyllum japonicum* (strongly recommended), *Citrus trifoliata*, *Cornus florida*, *C. Kousa*, *C. Nuttalli*, *C. Breitschneideri*, and *C. sanguinea*. The most striking of the *Cotoneasters*, viz., *horizontalis* and *Dielsiana*, *Disanthus cercidifolia*, *Enkianthus*, *Euptelia Franchetii* and *polyandra*, *Euonymus europaeus*, *E. alatus*, *E. latifolius*, *E. sanguineus*, and *E. atropurpureus*, *Fothergilla major*, *Ginkgo biloba*, *Gleditsia triacanthos*, *Hamamelis Zuccariniana* and *H. virginiana*, *Koeleruteria paniculata*, *Laurus Sassafras*, *Liriodendron tulipifera*, *Liquidambar styraciflua*, *Magnolia acuminata*, *M. tripetala*, *Menispermum canadense*, *Nandina domestica*, *Nyssa aquatica* and *N. sylvatica*, *Oxydendron arboreum*, *Parrotia persica*, *Photinia variabilis*, *Prunus Avium*, *Pseudolarix Kaempferi*, *Pyrus commixta*, *P. terminalis*, *P. pinnatifida*, *P. arbutifolia*, *P. alnifolia*, *P. Aucuparia* and *P. Vilmorini*, *Quercus rubra*, *Q. palustris* and *Q. coccinea*. Several *Azaleas*. *Rhus typhina* and *typhina laciniata*, *R. cotinoides*, *R. Polanini*, *R. glabra*, *R. sinica* and *R. aromatica*, *Ribes americanum*, *Rosa nitida*, *Spiraea japonica* and *S. Margaritae*, *Stuartia Pseudo-Camellia*, *Taxodium distichum*, *Tetracentron sinense*, *Vaccinium corymbosum*, *V. Arctostaphylos*, *V. pennsylvanicum* and *V. parvifolium*, *Viburnum Opulus* and *V. acerifolium*, *Ampelopsis Veitchii*, and several forms of *Vitis*, e.g. *V. quinquefolia*, *V. Coignetiae*, *V. amurensis*, *V. vitacea*, *V. Thunbergii*, *V. flexuosa*, and *V. Wilsonii*.—S. E. W.

Bamboos: their Culture and Uses in the United States. By E. T. Galloway (*U.S. Dep. Agr., Washington*, May 1925; illustrated).—During the past twenty-

five years the Office of Foreign Seed and Plant Introduction has imported into this country more than sixty inventoried numbers of bamboos, representing twelve imported genera. The major portion of the introductions has naturally come from the Orient, chiefly Japan and China. The uses of bamboos, propagation and culture, diseases and insect attacks, with an account of the literature, are all given in detail. The uses of bamboo are so numerous that to catalogue them would make a volume. The lightness and the strength of the large timber bamboo make it very valuable in many kinds of construction work. Many of the cosy homes of Japan are built almost entirely of timber bamboos. Unsplit poles are used for supporting posts, rafters, and beams, while split poles are employed for siding and many other purposes.—A. D. W.

Bean, Tests for Disease-resistant Varieties of. By D. Rands and W. Brother-ton, jun. (*U.S. Jour. Agr. Res.*, vol. xxxi. No. 2, July 1925, pp. 101-154).—This paper represents a summary of four years' testing of numerous beans (*Phaseolus vulgaris*) for resistance to anthracnose and bacterial blight. A total of 663 varieties and strains have been tested, including 170 American and 493 foreign varieties. Sixty-five varieties appear to possess decided resistance to anthracnose or bacterial blight, but only five were resistant to both diseases, twenty-seven resistant to anthracnose, and thirty-three to bacterial blight only. Since some of the most resistant varieties are late pole types of tropical or semi-tropical origin, it is possible that these may be of value for hybridization with susceptible American types.

The various tests are set forth in numerous tables in the paper, and a bibliography is appended.—A. B.

Beeches, Antarctic. By S. Mottet (*Rev. Hort.*, 1925, pp. 591-593; 3 figs.).—Two antarctic beeches of comparatively recent introduction are hardy, attractive, deciduous trees. *Nothofagus antarctica* is a native of Tierra del Fuego. The variety *uliginosa* has small oval leaves and small fruit. *N. obliqua* from Chile makes more rapid growth than our northern beeches and is very ornamental, with its spreading branches and reddish glabrous stems. The elliptical leaves are on short stalks. Both these trees dislike lime.—S. E. W.

Begonia Françoisii. By E. François (*Rev. Hort.*, 1925, pp. 597-598; 1 fig.).—*Begonia Françoisii* was found at an altitude of 5000 feet in Madagascar. It has large dark leaves covered on the upper surface with dark-red hairs, borne on long, hairy stalks. The white flowers appear small in comparison with the foliage. This *Begonia* will probably yield valuable hybrids.—S. E. W.

Bees for Acari, On the Microscopic Examination of. By D. Morland (*Ann. App. Biol.*, vol. xiii. No. 4, November 1926, pp. 502-505; 2 figs.).—The method of procedure in the examination of hive-bees for mite is explained in detail.

The figures clearly show the method of dissection and the positions taken up by the mites in the tracheæ. Stress is laid on the fact that failure to find mites in a sample of twenty bees is no criterion that the colony is free from Acari.

G. F. W.

Blackberries and Raspberries, The Gall Midges of. By H. F. Barnes (*Jour. Pomol.*, vol. v. No. 2, March 1926, pp. 137-140; 4 figs.).—A brief account is given of the following gall midges which attack blackberries and raspberries: the blackberry stem-gall midge, *Lasioptera rubi* Heeg.; the blackberry-leaf midge, *Perrisia plicatrix* Loew.; the blackberry-flower midge, *Contarinia rubicola* Rbs.; and the raspberry-cane midge, *Thomasia species*.

The adult insects are described and short notes are given of the life-history, type of gall, and remedial measures.—G. F. W.

Cacao, Studies in. Part I. The Method of Pollination. By S. C. Harland (*Ann. App. Biol.*, vol. xii. No. 4, Nov. 1925, pp. 403-409).—An enquiry as to the agents responsible for the pollination of Cacao flowers resulted in the opinion that small insects, either thrips, aphides, or ants, transfer the pollen from flower to flower.

The records of previous workers are reviewed.

Three sets of observations were made under field conditions in Trinidad: (i) flowers artificially pollinated, (ii) flowers attended by ants and aphides, and (iii) flowers unattended by insects, with the result that 35 per cent. of the flowers were pollinated when visited by insects and only 6 per cent. in the controls. When crawling insects were eliminated, it was found that 1 per cent. of the

flowers were pollinated, which fact suggested that some night-flying insects are implicated.

The results of the experiments are set out in three tables.—G. F. W.

Capricorn Beetle. By L. Billaudelle (*Rev. Hort.*, 1925, pp. 600-601; 3 figs.).—*Cerambyx scopoli*, the small Capricorn Beetle, is most destructive to fruit-trees and certain vegetables. The larvæ bore holes under the bark and tunnel into the stems and branches, weakening the tree, leaving it a prey to American Blight and causing gumming. To kill the larvæ, insert into the bore-hole a wad of cotton-wool dipped in carbon bisulphide or carbolic acid and plug the opening with clay.—S. E. W.

Christmas-tree Plantations. By A. K. Chittenden (*Michigan Agr. Exp. Sta. Special Bull.* 145, p. 9).—An account of the cultivation of the Norway Spruce for Christmas-trees.—A. S.

Chrysanthemums, Soil for. By A. Petit (*Rev. Hort.*, 1925, pp. 583-584, 603-604).—The following composts are suitable for growing Chrysanthemums in pots: Peat mixed with an equal bulk of leaf-soil or half its volume of well-rotted manure. Heavy loam mixed with half its volume of sand and enriched by the addition of double the amount of manure. Water the growing plants with a weak solution of ammonium sulphate. Some time after repotting apply a solution containing 0.1 gram of manganese sulphate to each plant.—S. E. W.

Coniferous Trees on the Farm, Growing and Planting. By C. R. Tillotson (*U.S. Dep. Agri., Farm. Bull.* 1453, July 1925).—This bulletin points out simple methods of collecting the seed, growing the trees, planting them out in the waste places on the farm, and giving them the small amount of care subsequently desirable. Probably the most important reason why coniferous trees are chosen for this important purpose is, that they will ordinarily take hold and thrive better than hardwoods on poor soil, while they are ornamental in winter as well as in summer, and as wind-breaks and for shade-giving they are much more effective than hardwoods the year round.—A. D. W.

Contact Insecticides, Studies on. Part IV. A Quantitative Examination of the Toxicity of Certain Plants and Plant Products to *Aphis rumicis* L. (the Bean Aphid). By F. Tattersfield, C. T. Gimmingham, and H. M. Morris. (*Ann. App. Biol.*, vol. xiii, No. 3, Aug. 1926, pp. 424-445; 6 tables).—Within the last few years, since the introduction of Derris-root as an insecticide, there has been a renewed interest taken in the possibility that other plants contain toxic properties. The authors have tested (besides alcoholic extracts of various tropical fish-poisons) lupins, broom, gorse, lobelia, and laburnum and a number of alkaloids as to their toxicity to *Aphis rumicis* L., the results being set out in six tables.

Promising results were obtained with (i) the roots and stems of White Haiari and (ii) the stems of Black Haiari (both species of *Lonchocarpus* from New Guinea), (iii) the roots of *Tephrosia toxicaria*, and (iv) the leaves of *T. Vogelii*.

The technique is described, together with an historical review of the plants used in the experiments.—G. F. W.

Cruciferae, Resistance to *Fusarium conglutinans* (Wollenw.). By E. C. Tims (*U.S. Jour. Agr. Res.*, vol. xxxii, No. 2, Jan. 1926, pp. 183-200).—Evidence has been accumulated which seems to justify the following statements regarding resistance to cabbage-yellows caused by *Fusarium conglutinans*.

No significant differences are noticeable in the root systems. Resistant plants may have a toxic substance killing the hyphae of the invading fungus, but the juices of resistant and non-resistant plants do not affect the growth of the fungus grown in nutrient solutions. *Fusarium conglutinans* grows over a hydrogen-ion range from P_{H3} to P_{H9} on many media. Cabbage-plants contain sulphur in appreciable quantities in the form of glucosides as well as volatile sulphur. It is suggested that a sulphur-containing compound present in cabbage-plants resistant to cabbage-yellows may account for the resistance factor. A short bibliography is added.—A. B.

Cruciferae, Ring-spot Disease of. By J. L. Weimer (*U.S. Jour. Agr. Res.*, vol. xxxii, No. 2, Jan. 1926, pp. 97-146; 6 plates).—A ring-spot disease caused by *Mycosphaerella brassicicola* is often found upon the foliage of cruciferous crops in the Pacific Coastal States. Broccoli, cauliflower, sprouts, cabbage, white

turnip, and kale are susceptible to the disease. The fungus has been isolated and its pathogenicity proved. The fungus enters through the stomata. Infection appears as minute dark spots in three to six days, with pycnidia developing within twenty-one days. The fungus can be grown on various culture media, beef and potato agars, plus 1 or 2 per cent. dextrose, and cauliflower leaves being the most satisfactory. The ravages of the fungus are checked by cold storage. Careful selection for hardiness and comparative immunity from the disease and good horticultural practice appear to be the best method for controlling the disease. A short bibliography is appended.—A. B.

Cucurbita Mosaic, Dissemination of. By S. P. Doolittle and M. N. Walker (*U.S. Jour. Agr. Res.*, vol. xxxi. No. 1, July 1925, pp. 1-58).—Earlier studies of the mosaic disease of *Cucurbita* have shown that neither the soil nor the seeds of the cucumber (*Cucumis sativus* L.) are sources of infection. The transmission of the mosaic disease appears to be through the seed of the wild cucumber (*Micrampelis lobata*), carried by cucumber aphid (*Aphis gossypii*), the striped beetle (*Diabrotica vittata* and *D. 12-punctata*). The striped beetle is the chief agent in transmitting the primary infection from the wild cucumbers to the cultivated cucumbers, for this insect first feeds upon the wild species and later upon the cultivated one.

Various other weeds (*Phytolacca decandra*, *Asclepias syriaca*, and *Nepeta Cataria*) often act as winter host-plants for the *Cucurbita* mosaic disease.—A. B.

Diospyros Kaki in Normandy. By G. Vilairé (*Rev. Hort.*, 1925, p. 376).—A Date Palm (*Diospyros Kaki*) grown in Normandy in the open was induced to bear fruit by removing a small piece of bark from each shoot opposite the fifth or sixth leaf from the top.—S. E. W.

Eucalyptus in Californian Plantations, Growth of. By Woodbridge Metcalf (*Coll. Agr., Berkeley, California*, Nov. 1924).—Trees of the genus *Eucalyptus* were introduced into California about the year 1860, and since that time have been so extensively used in plantations, wind-breaks, and ornamental plantings that they have become one of the most conspicuous features of the Californian landscape. Practically all of the plantation areas now consist of trees of one or more of the following species:—Blue Gum (*E. Globulus*), Gray Gum (*E. tereticornis*), Red Gum (*E. rostrata*), and Sugar Gum (*E. corymbocalyx*).

A. D. W.

Forest Planting in the Intermountain Region. By C. F. Korstian and F. S. Barker (*U.S. Dep. Agr., Washington*, Feb. 1925; illustrated).—The "intermountain region" is a term used to include the great expanse of country lying between the Sierra Nevada Mountains proper and the Rocky Mountains, bounded on the north by the Salmon River and on the south by the Colorado River, and situated mainly in the Great Basin and the Snake River watershed. Reforestation by direct seeding is impracticable in the intermountain region. The planting of nursery-grown stock has been successful under favourable site and other conditions. It is essential that the young trees, in order to become established when planted in the field, should be able to maintain a conservative balance between water absorption and water loss through transpiration. To accomplish this the transplant must have a root-system sufficiently long to reach into the soil strata which contain available soil moisture, even through prolonged dry periods. In order to preclude excessive transpiration the top must not be too large. Artificial forestation is destined ultimately to occupy a more important place in the management of the national forests of the intermountain region than at present.—A. D. W.

Forest Plantations, The Rainbow. By Henry Hicock (*U.S. Exp. Sta., Conn.*, Dec. 1924; illustrated).—The Rainbow Forest plantations occupy approximately 100 acres in the towns Windsor and East Granby, about half a mile from the village of Rainbow. Seventy plots make up the tract, of each of which a description with report of progress is given. In general, experiments in regeneration by seeding were not successful. Planting, on the other hand, has been attended by good results, any failure being traceable to using unsuitable species or other reason. Of the experiments with hardwoods, only three species were successful, including red oak, black locust, and chestnut. Of coniferous, three species stand out conspicuously above all others used. These are red, white, and Scots pine. Of these the Scots pine has grown the fastest.

A. D. W.

Forestry, Quarterly Journal of (No. 1, vol. xix, Jan. 1925).—"Intensive silviculture," by E. R. Pratt, is a thoughtful article that somewhat departs from the usual lines laid down for the management of woods and plantations. True enough, the student is often discouraged and the landlord prevented from planting by the publication of balance-sheets showing no profits, because all receipts from by-products have been omitted. In England, with the markets created by our large population so close, the possibilities of by-products are infinitely greater than in the majority of Continental forests, and, in fact, the forester seldom plants without being able to make some considerable income from one or other of these. In making out statistics for questions of national policy, in considering the planting of new areas, in converting inferior woods into economic propositions, we must make proper estimates, giving forestry the credit for all its by-products.

"Clear Cutting or Shelterwood," by Sir William Schlich, has special reference to spruce woods in Saxony, in which there was a great reduction of production on areas worked under the clear-cutting method, as compared with that of areas worked under the shelterwood method. The forester must adopt that method of treatment which secures, during the growing season, as far as possible, that degree of moisture in the soil which is most suitable for the favourable development of the species under treatment.—A. D. W.

Forestry, Quarterly Journal of (No. 2, vol. xix, April 1925).—"The Japanese Larch," by A. C. Forbes. The general conclusions that have been arrived at about Japanese larch, though far from final at the moment, tend to favour the theory that it will prove of secondary value as a timber-tree in British and Irish forestry, and that it is a species which should be used with a certain amount of caution, especially in mixture. Used in discretion in mixture with fast-growing species, or as pure crops for early cutting, it should prove of considerable value in the damper parts of the British Isles, where injury from drought is not likely to occur. "Sample Plots at Huntley Manor," by C. P. Ackers, M.A., B.Sc. Valuable information is contained in this report of the results obtained from a number of plots, 13 in number, that were planted with various species of timber-trees. The conclusions arrived at are, that Douglas fir and Sitka spruce mixture is a bad one, that a Douglas and larch mixture is a very good one, and that the planting of Japanese larch at 4 to 4½ feet apart may prove a better financial success than a more widely spaced plantation, though the volume of the latter may be greater, but probably the stems less straight, giving more waste on conversion. Also, that, though Japanese may die back badly in a particularly dry summer, their powers of recovery is very great. The article has several illustrations, as also a small plan showing the situation and height of the plantation above sea-level.

"Norfolk Woodlands, from the Evidence of Contemporary Chronicles," by Sir Hugh Beevor, Bart., reprinted from the *Transactions of The Norfolk and Norwich Naturalists' Society*, 1924, contains much interesting information and points out the large size and splendid quality of the timber produced in these parts of England. "The Magnolias," by W. Dallimore, is a well-timed contribution regarding the various kinds of this beautiful section of flowering trees or shrubs. Many combine the attractions of bold and shapely outline with those of ornamental flowers and handsome foliage. The greater part are hardy in this country.—A. D. W.

Forestry, Quarterly Journal of (No. 3, vol. xix, July 1925).—"The Replanting of Cleared Areas," by Col. G. F. T. Leather, contains much of a useful nature with reference to this rather debatable method of managing a plantation. The scheme here put forward has certainly much in its favour, as it entails a minimum of Government control and at the same time does not bear too harshly on the community.

"New Forests in East Anglia," by W. L. Taylor. The activities of the Forestry Commission in the Eastern Counties date from the purchase of Tangham Forest and the surrounding lands in 1919. Planting of this area, which extends to 2554 acres, was set about at once, as also dealing with the lands of Tunstall and Iken Heaths. Additional lands have been purchased during the past two years, and the total area now in hand for the Department's purposes has grown to 4604 acres. The plantations have done splendidly, an examination of these by the writer in 1926 clearly demonstrating that the work of clearing the ground and planting the young trees had been carried out in a most satisfactory manner.

"Commercial Forestry," by A. D. C. Le Sueur, and notes on "The Japanese Larch," by A. Slater, are other valuable papers that well merit perusal.—A. D. W.

Forestry, Quarterly Journal of (No. 4, vol. xix, Oct. 1925).—"The Asiatic Spruces," by W. Dallimore, is a readable paper, though many of the kinds enumerated are only suitable for planting in the milder parts of the British Isles. Such species as *Picea Morinda*, *P. orientalis*, *P. polita*, and *P. Glehnii* may be relied upon.

"Notes on the Felted Beech Coccus," by J. W. Munro, give some valuable information with reference to this pest of beech-wood lands, many accounts of which have, however, been published of late years.—A. D. W.

Forestry, Quarterly Journal of (No. 1, vol. xx, Jan. 1926).—"Economic Forestry," by T. H. Forrester Addie, is an interesting account of the management of the produce from the plantations that were formed around Lake Vyrnwy, mostly near a quarter of a century ago. Little or no thinning was attempted prior to the conclusion of the war. Thinning became imperative for the well-being of the forest, and the Corporation were faced with a heavy charge for thinning, coupled with the fact that, owing to the distance from the railway station, the resultant thinnings could find no ready market at any figure which would prove in any way profitable. It was, therefore, decided that some form of manufactured article must be made from the thinnings, and it was finally decided to turn attention to making the thinnings into serviceable fencing and wood-wool, with a side-line of building of rustic huts from the waste. Briefly, it may be stated that the undertaking has turned out in every way successful.

"Methods of Rabbit Catching and Control in East Anglia," by James McDougall. The best time for catching rabbits is from September until a little after Christmas. With two warreners, a 500-acre block can be completely cleared of rabbits in about three months. A warreners' stock-in-trade consists of one or two lurcher dogs, four or five ferrets, traps, and a digging spade.

"Marketing of Home-grown Timber," by W. H. Lovegrove, is a short paper on this important subject, but one that is well to the point. Concentration on cheaper transport, cheaper and more accurate sawing, and a system of grading and organized marketing are the principal recommendations.

"Fire Protection," by J. Scott Kerr, S.F.I., with reference to a plantation in the South of Ireland that had been destroyed by fire the second time in twenty years, is a valuable contribution to our knowledge of how best to avoid these conflagrations. This took the line of endeavouring to find a natural carpeting which, if laid down around the plantation, would in due course suppress the indigenous growths, and at the same time substitute a fire-proof zone. The carpeting, of course, must in itself be non-inflammable. The experiment was made with the hawk-weed (*Hieracium*), for this composite plant, prolific and hardy, has the properties of spreading freely and of absorbing and retaining in the stems and leaves a relatively large amount of water, and by tests its resistance to fire was proved. Unfortunately, after several hundreds of these plants had been put down, the experiment came to an untimely end by reason of the death of the owner of the estate and disabilities engendered by the great war. In other woodlands the planting of *Hieracium lanatum* as a protection against the spread of fire has been successfully carried out. It is hoped that further experiments with this plant will be carried out.—A. D. W.

Forestry, Quarterly Journal of (No. 2, vol. xx, April 1926).—"The Hollies or Species of *Ilex*," by W. Dallimore, contains an interesting description of these popular trees and shrubs, which are represented in the British Isles by a single species, the common holly (*I. aquifolium*), a very important tree from a decorative point of view, and also of considerable utilitarian value. A number of species are dealt with, two of the most valuable, whether for town or country planting, being *I. Shepherdii* and *I. Hodginsii*. "First Thinnings," by Lt.-Col. G. F. T. Leather, points out in a clear manner how these, the bugbear of the forester, especially in these days of dear labour, can be profitably utilized in various ways. "Thinning Practice," by Mark L. Anderson, is rather of a theoretical than a practical nature, but the information relating to actual returns is of a most useful nature and of rather uncommon occurrence in forestry literature. "Wood, leaf and needle research," by Hans Burger, though Swiss foresters have unfavourably criticised the paper, yet much of a profitable nature to the British forester will be found in its perusal. The Editorial notes in this as well as other numbers of the Journal are of a most practical kind and are a decided acquisition.

A. D. W.

Forestry, Quarterly Journal of (No. 3, vol. xx, July 1926).—"Some South African Forests," by Col. Gerard Leather. Many visitors to the Cape Province and Northern Transvaal have written in praise of the well-managed forest-lands,

and particularly the Government Forest of Knysna. No lover of forestry visiting South Africa should miss seeing this forest, though the interesting description of the principal trees and other details will be welcome to those who have not the pleasure of so doing.

"The World Forestry Congress" which was held at Rome during last summer proved by the very large attendance the vitality of the forestry movement, though it was no easy matter to organize a body of some 800 men and women of all nationalities. This great gathering was an inspiration to all who attended it, and will, undoubtedly, have its effect upon the forestry policy of the future. The object of the Congress was set out very clearly in the pamphlet issued by the International Institute of Agriculture, who stated that they had taken steps to organize the Congress in view of the constantly increasing importance of forestry, as also the allied industries, in the economic life of all countries which are either importers or exporters of forest produce.

"The Genus *Glyptostrobus*," by J. Burtt Davy. This is an important paper in which Professor Augustine Henry and Mrs. Marion McIntyre have collated the available information on that rare and interesting Chinese conifer. They correct the erroneous statement in books that there is more than one living species of the genus. The scarcity of this tree in the British Islands, as stated by these writers, is, however, not borne out by facts, as the tree is much more plentiful than is generally supposed, reference to which has been made in the next JOURNAL by the Hon. Vicary Gibbs.—A. D. W.

Forestry, Quarterly Journal of (No. 4, vol. xx, Oct. 1926).—"Forestry from a Business Point of View," by Leslie S. Wood, brings home to landlords, their agents, and others the importance of the business side of a great rural industry that has been woefully neglected in the past, but is gradually beginning to take an important place in country life and the well-being of the nation. Forestry, as we understand it to-day, is very different from the process of mismanagement that has characterized a very large area of the British woodlands in the past, so that we do an injustice to forestry if we judge it from the neglected areas that form the greater part of our woodlands. "Estate Sawmills," by Col. Gerard Leather, raises several important points in the management of our timber-trees. The question naturally arises, why should not the grower of timber become his own timber-merchant? The reasons are, no doubt, many, but the two chief ones are, firstly, that the owner of woods often does not know how to go about it, and, secondly, he fears the capital outlay.

"The Ecological Approach to Silviculture," by A. S. Watt, shows how keen is the interest being taken in the life of the forest as a whole, not in the trees alone, nor in the subsidiary vegetation alone, but in the relation of one to the other and of both to the habitat. The conclusions arrived at are, that the study of tree behaviour approached by this method provides the information essential to silvicultural practice. It further opens up a way of studying the relationship between the living things in the woodland and of obtaining a relative measure of these. Also, how far the welfare of the tree is dependent on the flora and fauna.

"The Genus *Glyptostrobus*," by the Hon. Vicary Gibbs, points out the "incorrect statement" that has been made by Professor Henry in the last number of the JOURNAL with reference to the hardihood of this interesting Chinese tree in various parts of this country. Dr. Henry has evidently followed the statement made in several works on trees that there is only one specimen living in the open in the British Isles. Over twenty are known. This points out how careful writers should be in repeating hearsay regarding the growth of coniferous trees in this country, and the Hon. Vicary Gibbs truthfully adds, "Negatives are very dangerous, and, being of a more cautious type than Professor Henry, I never venture on them without guarding myself by some such phrase as "so far as my limited experience goes" or "to the best of my belief."

A. D. W.

Forestry, Transactions of the Royal Scottish Arboricultural Society (vol. xxxviii, part 2, Oct. 1924).—An inquiry into "The Suitability of Scottish-grown Timber for Aeroplane and Pit-prop Purposes," by Professor T. Hudson Beare, M.Inst.C.E., D.L., has been attended with very promising results. The pit-props tested in 1920 were mainly Scots pine, spruce, and larch, and for comparison purposes a set of foreign pit-props of Finnish red and white wood. A series of tables give the more important results, from which it will be seen that the strength of the three home-grown timbers is very close to that obtained in the tests of the foreign-grown Finnish redwood. "Making a Nursery on Loch Katrine Side," by John

Munro, contains much valuable information on this important subject, and particularly in connexion with the raising of young trees for afforesting the catchment areas of waterworks. Laying out the ground, drainage, preparing the soil, and seed-sowing are all dwelt with in this paper. The report on the "Forestry Exhibition at the Highland and Agricultural Society Show at Perth" is pleasant reading. The timber and other exhibits were of a very high standard of quality and merit.—*A. D. W.*

Forestry, Transactions of the Royal Scottish Arboricultural Society (vol. xxxix, part 1, March 1925).—To the Aberdeen branch of the Society, Provost Donald Munro, O.B.E., gave a most instructive address on "Home Timber and Housing." His remarks on the value of the Scots pine as a valuable timber-producer and the important uses to which the wood has been applied are timely at a period like the present, when the erection of houses in that material is causing a considerable amount of discussion. References to the various uses to which native pinewood from the Ballochbuie Forest, on the King's Balmoral estate, are of much interest, as showing the lasting properties of matured timber of this kind. It is of interest to know that at the instigation of King Edward the entrance hall at Balmoral Castle was panelled with Scots pine, while the billiard-room is also finished in this wood. Bothies or houses erected twenty-seven years ago on the Balmoral estate are now as sound as when put up, having been built of sawn Scots pine timber. "The Effects of Frost on the Wood of the Larch," (by M. Y. Orr), would appear to be more serious than is generally supposed. The defects take the form of the well-known "frost cracks," which make their appearance in the wood, and the less-known "frost cankers," which always occur at the base of branches which have been killed by late frosts. In the case of the former, the fissures produced as a result of freezing closely resemble those cracks which appear in felled timber and are caused by shrinkage due to drying. "The Need for Afforestation and its Possibilities for Employment" was the title of an address given before the members of the Aberdeen Rotary Club by Provost Donald Munro, O.B.E., in which he emphasized the necessity for the more extended planting of trees of a purely commercial type. No country, he said, imports so large a quantity of timber as Britain—no country is, therefore, so absolutely dependent upon outside supplies. Why should we buy timber when we can grow it?—*A. D. W.*

Forestry, Transactions of the Royal Scottish Arboricultural Society (vol. xxxix, part 2, Oct., 1925).—In a review of the Forestry Commissioners' work, by the Right Hon. Lord Lovat, K.T., several points of the greatest importance in connexion with the needs for afforestation are discussed. It is not so well known as it should be that a census of woodlands supervised by the Forestry Service, but conducted entirely by voluntary workers, was begun in 1920, and will be ready in the course of the present year. At a cost of well under £6000, including cost of material and the paid services of another Government Department, for the first time in history a complete survey of the woodlands of Great Britain—State as well as privately owned—will be available. This census will give the names and areas of woodlands, divided into conifers, hardwoods, mixed conifers and hardwoods, duly divided into age classes. It will also give the area of coppice with and without standards, and the area lying derelict or denuded of timber. It is intended to keep this census of woodlands up to date. Sir John Stirling Maxwell, Bt., gives an account of his "Practical Experiments on the Planting of Bog Lands and the Use of Manure in Dealing with Such." High-grade basic slag is the manure employed, the usual method being to mix the manure with seven times its bulk of mineral soil and give two handfuls of the compost to each plant. Basic slag costs about 55s. per ton; two ounces per plant costs just under 9s. per acre. In the North of Ireland very good results have followed the application of clayey loam and refuse from old cottages that were pulled down, a spadeful of this being given to soil from each pit before planting was engaged in. Heretofore, it has been considered that only in a few of the eastern English counties can willow-timber suitable for the manufacture of high-grade cricket-bats be successfully cultivated, but it is now clear from the excellent paper on "The Cricket Bat Willow," by J. Arthur Campbell of Arduaine, that in Scotland the growth of this particular variety can be profitably carried out.

A. D. W.

Forestry, Transactions of the Royal Scottish Arboricultural Society (vol. xl, part 1, March 1926).—"Land Acquisition and Forest Workers' Holdings," by the Right Hon. Lord Lovat, K.T., K.C.V.O., etc., contains some valuable information

with reference to afforestation. By the end of this planting season, by State and private enterprise, we expect to have planted, or to have assisted in planting, between 130,000 and 140,000 acres. Next season the State planting programme alone will be just over 22,000 acres, and for the two following years 26,000 and 30,000 acres respectively. "Pitwood in Relation to the Production of Coal: a statement prepared for the North of Scotland Home Timber Merchants' Association," contains information of considerable interest, such as that, as a result of tests carried out under the auspices of the Institution of Mining Engineers, of the crushing strengths of various sizes of pit-props. The strength of props made from home-grown timber was over 13 per cent. higher than that of props from foreign timber. Regarding the cost of timber in coal-mining, the official returns are given as a fraction over 7d. for mining timber for every ton of coal raised. "Peat Planting," by Ernest V. Laing, M.A., B.Sc., is a valuable contribution to successful dealing with a class of land that is common all over Great Britain and Ireland. "A New Disease of the Douglas Fir in Scotland," with plates, by Malcolm Wilson, D.Sc., and Mary J. F. Wilson, B.Sc. The disease caused by *Rhabdochloa Pseudotsugae* was in all probability introduced to the South of Scotland before 1914, but did not produce any serious effects until about 1922. In this fungus disease, the young leaves are infected during the summer, and apothecia are developed during the following spring, and after the spores have been shed the leaves drop off affected trees. The appearance of this and other diseases in this country draws attention to the danger of introducing plants from abroad without careful examination by trained mycologists upon their arrival.—A. D. W.

Fruit-flies. By T. McCarthy (*Agr. Gaz. N.S.W.* vol. xxxvi. pp. 667-668).—Calcium arsenate poisons Fruit flies more rapidly than lead arsenate.—S. E. W.

Fruit-fly Control. By W. B. Gurney (*Agr. Gaz. N.S.W.* vol. xxxvi. pp. 879-887; 6 figs.).—Fruit-flies in orchards are poisoned by a solution of calcium arsenate or sodium arsenate sweetened by the addition of molasses and fruit juice. Boards dipped in this bait are suspended in the branches of the trees by wire hooks. They require to be re-dipped every week.—S. E. W.

Fruit-trees, Pruning. By L. Aubin (*Rev. Hort.*, 1925, pp. 476, 477).—In the old gardens at Montreuil, where vegetation is seldom exuberant, larger apples and pears are produced on the unpruned than on the pruned trees.—S. E. W.

Germination of Orchid Seeds. By G. Bultel (*Rev. Hort.*, 1925, pp. 318-321, 334-339, and 359-363; 14 plates).—To ensure the germination of Orchid seeds, a bed of Sphagnum moss and *Osmunda* fibre is impregnated with a pure culture of *Rhizoctonia* several days before the Orchid seed is planted. To protect from contamination, the ripe seed-vessels are dipped in alcohol and ignited, then opened and the seed transferred to sterilized tubes, where they are preserved till wanted.

Germination can take place in the absence of *Rhizoctonia* if the aseptic seeds are sown in a suitable gelatinous medium containing sugar, and perfectly normal Orchids result.—S. E. W.

Gladioli Bulbs. By S. Mottet (*Rev. Hort.*, 1925, pp. 398-400; 2 figs.).—The young globular Gladioli bulbs flower later than the large flat disc-shaped older bulbs of the same variety. By planting a mixture of old and young bulbs the flowering period is prolonged.—S. E. W.

Gladiolus primulinus Hybrids. By S. Mottet (*Rev. Hort.*, 1925, pp. 314-315; 1 col. plate).—Three new hybrids of *Gladiolus primulinus*, viz.: Martinet, La Bethune, and La Dyle, are represented in the coloured plate. All three are characterized by the size of their flowers, borne on upright stems. Martinet is remarkable for its yellow flowers, in which no trace of red is perceptible.—S. E. W.

Grafting Fruit-buds. By V. Enfer (*Rev. Hort.*, 1925, pp. 502-503).—Pears which make too vigorous growth may be brought into bearing by grafting fruit-buds. The operation must be carried out between August 15 and September 15.—S. E. W.

Grapes, Dessert. By E. Rouart (*Rev. Hort.*, 1925, pp. 568-569).—It is suggested that the following disease-resistant vines should be tried where Chasselas

fails: White Seibel 5279 and Thomur de Baco ripen early and are good croppers. The former does not travel well, owing to its thin skin. Seibel 4762 is mid-season and Seibel blanc 5860 ripens later. It is very vigorous. Seibel 6468 is inferior to the above in flavour. 8213 Chasselas Baco and Celine are good. The only good red grape is Seibel 5813, which ripens late and has an excellent flavour and does well in the South of France.—S. E. W.

Hemiptera, and the Resulting Effects upon the Plant Tissue, with Special Reference to the Potato Plant; A Comparative Study of the Feeding Methods of Certain. By K. M. Smith (*Ann. App. Biol.*, vol. xiii, No. 1, Feb. 1926, pp. 109-139; 10 figs., 4 plates).—Studies were made on the feeding methods of species representative of the Order Hemiptera (capsid bugs, "leaf-hoppers," "white flies," aphides and scale insects) in relation to the potato plant. The methods by which the various haustellate insects penetrate the tissues of plants are explained and illustrated by means of text figures and photomicrographs. The paper concludes with a discussion on the relationship which these sucking insects have to the transmission of virus diseases in the potato plant.—G. F. W.

Hydrocyanic Acid Gas, The Fumigation of Tomato-houses with. By E. R. Speyer and O. Owen (*Ann. App. Biol.*, vol. xiii, No. 1, Feb. 1926, pp. 144-147).—It is shown that a slow process of generating hydrocyanic acid gas by the decomposition of sodium cyanide and sodium bicarbonate is an effective and easy method of fumigating glasshouses. Detailed directions for the fumigation of tomato-houses are given. The required dose for destroying "white fly" is three parts of sodium bicarbonate and one part of sodium cyanide by weight, using one ounce of the mixture to every 1000 cubic feet of space. The mixture is sprinkled by means of a canister on the paths of the houses and the usual precautions taken as when this gas is generated by means of the pot method with sulphuric acid.

G. F. W.

Inarching. By E. A. Neil (*Agr. Gaz. N.S.W.*, vol. xxxvi, pp. 812-816; 4 figs.).—Damaged trees may be restored by inarching; a sucker from the root is grafted into a branch above the damaged part of the tree. If no sucker is available, a scion from a new root system is planted near the tree and grafted when tall enough. The operation is made clear in the accompanying figures.

S. E. W.

Incarvillea variabilis Hybrids. By A. Meunissier (*Rev. Hort.*, 1925, pp. 520-521; 1 col. plate).—A new race of hybrid *Incarvillea* has been raised from the yellow-flowered *I. variabilis* named *Przewalskii* or *Farreri*. These hybrids range in colour from white to pink, yellow, and salmon. They are hardy, preferring a light soil.—S. E. W.

Insect Attack and the Internal Condition of the Plant. By A. H. Lees (*Ann. App. Biol.*, vol. xiii, No. 4, November 1926, pp. 506-515).—The author has collected together fourteen cases from different parts of the world which show that the susceptibility of certain host-plants to insect attack varies with the conditions under which the plant is growing.

Cases in which British conditions are mentioned include (i) the susceptibility of bearing over non-bearing apple-trees to aphid attack in Herefordshire; (ii) the greater resistance to aphid attack of apples and plums growing in grass orchards to the same kind of tree in arable land; (iii) the effect of applying dung in autumn to Pershore egg-plums in Worcestershire resulted in a greater susceptibility to leaf-curling aphid two years later; and (iv) the effect of rainfall on the production of big bud in "Seabrook's Black" currant. Higher resistance to attack was obtained in eastern England than in the south-west, where the April-September rainfall is 4.99 inches heavier than in the eastern counties.

The paper concludes with a general discussion on the problems underlying host endurance, which is a variable quantity depending on external conditions.

G. F. W.

Insect Eggs. A Quantitative Examination of the Toxicity of 3: 5-Dinitro-o-Cresol and Other Compounds, under Laboratory and Field Conditions to. By C. T. Gimmingham, A. M. Massee, and F. Tattersfield (*Ann. App. Biol.*, vol. xiii, No. 3, August 1926, pp. 446-465; 2 figs.).—Laboratory experiments included tests as to the toxicity of 3: 5-dinitro-o-cresol and its sodium salt on the eggs of the Purple Thorn moth (*Selesia tetralunaria* Hufn.) and other species of moths and two species of aphides, with the result that these chemicals proved to be highly toxic to all the species.

Field experiments were made with the same materials on plum-trees against the hop-damson aphid (*Phorodon humuli* Schr.), the result being that the trees were cleansed and almost free from aphid attack, whereas the control trees experienced a heavy attack of aphid.

A reliable method for judging the effects of washes on the mortality of insect eggs is explained.—G. F. W.

Insect Pests on Fruit, Notes on Some Unusual. By F. V. Theobald (*Jour. Pomology*, vol. v. No. 4, October 1926, pp. 241-247; 5 figs.).—Short notices are given of the life-history, food-plants, and remedial measures of the following insect pests not usually associated with fruit-trees: (i) Old Lady moth (*Mania maura*), larvæ eating off the shoots and buds of plums, peaches, and nectarines; (ii) large earwig (*Forficula auricularia*), feeding on the unopened blossoms and buds of plums; and (iii) Thrips (*Thrips tabaci* Lind. and *T. flavus* Schrank.), damaging the blossoms and young fruitlets of American Blackberries.—G. F. W.

Insecticides for Root Mealy Bug and Root Aphid, Investigations Into. By Winifred H. Saunders (*Ann. App. Biol.*, vol. xiii. No. 4, November 1926, pp. 495-501).—Investigations were commenced in 1915 to ascertain some suitable treatment for pot-plants in greenhouses against the attacks of root mealy bug (*Rhizococcus dianthi* n. sp.) and lettuce-root aphid (*Pemphigus lactucarius* Pass.). As both pests live under similar conditions in pots and adopt similar methods of feeding and protection, the response to any particular treatment is identical.

The chemicals were applied to various species of *Acacia* grown in pots of 200 c.c. capacity. The method of treatment and the effect of the various substances on the pests and host-plants are given. Out of twenty-nine chemicals tested only three gave promising results; these were Tetrachlorethane (Westoran), Trichlorethylene (Westropol), and Potassium sulpho-carbonate.—G. F. W.

Kalanchoe gracilipes. By E. François (*Rev. Hort.*, 1925, pp. 413, 414; 1 fig.).—*Kalanchoe gracilipes* is easily raised from seed or cuttings. Planted in a mixture of Sphagnum and leaf-soil, in hanging baskets, it forms an attractive feature in a temperate house in partial shade, as it is very floriferous.—S. E. W.

Lilium leucanthum var. Sargentiae. By E. Debras (*Rev. Hort.*, 1925, p. 519; 1 fig.).—*Lilium Sargentiae* bears trumpet-shaped flowers on a stout stem. The blooms are violet-purple externally and white with a golden throat internally. The period of flowering is later than *L. regale* and earlier than *L. sulphureum*. The lily attains a height of five feet, is very bulbiferous, and can survive mild winters in the open. Like *L. regale* and *L. sulphureum* the flowers are very fragrant.—S. E. W.

Orange-trees, Renovation. By R. J. Benton (*Agr. Gaz. N.S.W.*, vol. xxxvi. pp. 899-903; 3 figs.).—Inferior types of trees producing unsuitable oranges are cut down to two feet from the ground and grafted with carefully selected scions. Weak trees are invigorated by feeding with farmyard manure and mulching with rotting straw or hay. Surface soil from unused paddocks is beneficial. Trees lacking vigour require nitrogenous fertilizers. Give superphosphate to healthy trees and potassium sulphate (1-3 pounds to a tree) to increase the size of the oranges.—S. E. W.

Pears, Blight Resistance in Pears and Characteristics of Pear Species and Stocks. By F. C. Reimer (*Exp. Sta. Oregon, U.S. Bull.* 214, June 1925, p. 99).—During the preceding ten years this station assembled practically all the known wild species of pears and most of the available varieties from Europe, Africa, and Asia, and tested them for resistance to *Baccillus amylovorus*. There is great variation among the seedlings of each of the species tested; some are very susceptible, while others are highly resistant. The European species have proved far more susceptible than most of the Oriental species. In every species, except the wild type of *P. ussuriensis*, the vast majority of the seedlings blight readily in the young shoots, but while this species has given a comparatively high percentage of resistant seedlings it "is of little or no value, due to its exceedingly slow growth." "*P. Calleryana* has shown a higher degree of resistance to blight in the trunks and roots than any of the other species suitable for rootstocks. In this species only 9.1 per cent. of the trees which were inoculated in the roots blighted, and 5.5 per cent. of the trees proved immune in all parts of the tree. Young trees on this stock are more vigorous than those on any other species. This appears to be the most promising rootstock for Southern Oregon," but

"until further evidence is available this species should not be planted where the temperature goes lower than ten degrees below zero." "*P. Calleryana* cannot be considered one of the more promising species for the pear breeder," for "the fruits of this species are extremely small, filled with grit cells, and utterly worthless for eating."—A. S.

Pears, Pruning. By G. A. Meier (*Agr. Gaz. N.S.W.*, vol. xxxvi. p. 512).—When pruning Winter Nellis, keep the centre of the tree open and allow the laterals on the outside their full length. When the tree reaches full bearing, reduce the laterals and drastically thin the spurs. Josephine: the best results are obtained by leaving the leaders and laterals untopped, but remove those which are too close together.

Beurre Bosc: Prune hard for the first four years to get the required number of leaders; cut off strong laterals one inch from the leaders. Leave the weak laterals their full length and cut back the medium laterals to two or three inches. When the tree has sufficient leaders leave them untopped.—S. E. W.

Pears, The Control of Core Break-down in. By Henry Hartman (*Exp. Sta. Oregon, U.S. Bull.* 216, June 1925, p. 16).—An account of experiments. "In all the tests and observations made, only the fruit harvested after its best picking time became affected." "It is fairly certain that core break-down can be controlled by picking at the proper time and that this can be done without sacrifice of either tonnage or quality." The amount of disease does not seem to be influenced by either the kind of storage or the length of the storage period.

A. S.

Peat. By A. Petit (*Rev. Hort.*, 1925, pp. 496, 497, 531-533).—The disadvantages of peat are its acidity and its poverty in phosphates and assimilable nitrogen. Contrary to general belief, it is an advantage to supply plants grown in peat with hard water. Pot-plants benefit by the addition of 0.2 % of sodium nitrate and potassium phosphate to the water supplied to them.—S. E. W.

Pink Imperator, Double Chinese. By F. Blot (*Rev. Hort.*, 1925, pp. 604-605; 1 col. plate).—The double Chinese Pink Imperator is noticeable for its ample foliage and large, gay flowers. It is easily raised from seed sown under glass in May or in September. It flowers in summer and is useful for cut blooms.—S. E. W.

Poison Plants. By M. Henry (*Agr. Gaz. N.S.W.*, vol. xxxvi. p. 863).—The Cape Tulip (*Homeria collina*) and a vine, *Marsdenia*, are poisonous to stock.
S. E. W.

Physics of Spray Fluids, The. V. Paraffin-Cresol-Soap Solutions: The Deterrent Action of Soaps. By R. M. Woodward (*Jour. Pomol.*, vol. v. No. 1, Dec. 1925, pp. 43-49).—Experiments were made to ascertain the best proportions of the constituents in paraffin-cresol-soap solutions, so that the maximum amount of oil is completely dissolved on addition of certain amounts of water, the oil remaining in solution for all other dilutions.

An account is given of the various methods of preparing the mixture and the results are set out in two tables.

It was found that paraffin-oil is far more soluble in cresol-soap solutions than in ordinary soap solutions, and it is suggested that soaps containing phenols (e.g. carbolic acid comm. or cresol) should be more effective than ordinary soaps. Solutions up to 20 per cent. paraffin-oil can be made by the aid of soap and cresols. It is further suggested that such solutions would be suitable for winter washes.—G. F. W.

Potatoes in North Wales, Insects attacking. By C. L. Walton (*Ann. App. Biol.*, vol. xii, No. 4, Nov. 1925, pp. 529-535).—The paper takes the form of a crop-pest report, and deals in a general way with the insects found damaging potatoes, particularly the haulm. The observations were made on not less than 3000 plants in some two hundred stations (fields and gardens), at elevations ranging from sea-level to over 1000 feet, in the four counties of North Wales, and chiefly in Anglesey and Carnarvon.

The research was undertaken because of the important part that sucking insects play in the transmission of virus diseases.

The following pests are recorded, together with observations on each species: springtails, 4 spp.; aphides, 5 spp.; cuckoo-spit insects, leaf-hoppers, 1 sp.;

capsid bugs, 5 spp.; mealy bug (*Pseudococcus gahani*); the beetle, *Psylliodes affinis*, and the larvæ of garden and cockchafers and click beetles.—G. F. W.

Pruning Ohanez and Cornichon Vines. By J. M. Arthur (*Ag. Gaz. N.S.W.*, vol. xxxvi. pp. 291-292; 1 fig.).—The Ohanez Vine requires special pruning. It is headed to a wire 2½ feet from the ground and a short permanent arm 1½ feet formed on either side. From each arm two or more rods are trained to a wire about 18 inches above the lower one, and each terminal is trained to the lower one.

The Cornichon Vine is a heavy cropper. When it fails a second crop can be obtained by summer-topping the current canes.—S. E. W.

Pyracantha. By A. Meunissier (*Rev. Hort.*, 1925, pp. 572-574; 2 plates, 1 col.).—*Pyracanthas* are valuable for covering walls or making hedges, as their foliage and coloured berries are very attractive. They are not fastidious as to soil and can be propagated by grafting in spring or budding in autumn. They are easily raised from seed, and the seedlings soon produce berries. Dusting with powdered aloes and quassia is a protection from the birds, to which the berries offer an irresistible attraction. Only the young trees will survive transplanting. The most interesting varieties are *P. crenulata*, *P. Gibbsii*, *yunnanensis*, *Rogersiana*, *flava*, and the well-known *Lalandei*.

P. crenulata var. *yunnanensis* is more vigorous than the type and is more fruitful. The berries are dark red. *P. c. Rogersiana* has orange-coloured berries larger than the type. The variety has larger yellow berries. *P. c. Gibbsii* is a magnificent shrub with larger leaves but smaller berries than the preceding.

S. E. W.

Rhubarb, Downy Mildew. By W. A. Birmingham (*Ag. Gaz. N.S.W.*, vol. xxxvi. pp. 288-290; 3 figs.).—*Peronospora jaapiana*, Downy Mildew, attacks rhubarb-leaves, producing pale-brown angular patches. Spraying with Bordeaux Mixture is suggested as a preventive.—S. E. W.

Planting the Roadside. By F. L. Mulford (*U.S. Dep. Agr.*, June 1926).—The appearance as well as the comfort of roads is greatly enhanced by suitable tree-planting on the right of way, and this can be satisfactorily done in some manner by the community as a whole, rather than by leaving it to individual initiative. The adoption of a proper planting scheme for any road requires careful study by one familiar with the subject and with the possibilities of the location. Planting must not hide approaching traffic, cause snow-drifts, interfere with safe footpaths, provide unsuitable trees, or interfere unduly with adjoining farm-lands. The kinds of trees to use, guards, pruning, and attention to insect and fungus pests, with a set of useful plates, are, likewise, included.—A. D. W.

Saltbushes and their Allies in the United States. By G. L. Bidwell and E. O. Wootton (*U.S. Department of Agriculture, Washington*, October 1925).—Many millions of acres of the arid Western States are partially covered by various native plants which afford grazing to large numbers of farm stock for the greater part of each year. The term "saltbush" has very properly been given to the group which contains the most species, as well as the largest number of individuals, nearly all of which have a pronounced salty taste. Most of these belong to the genus *Atriplex*, although certain species of this genus are known by various other common names. "Sagebrush" is, perhaps, more common than any other, although more properly applied to species of the genus *Artemisia*, the leaves of which are invariably strongly aromatic, and rarely if ever salty. It is not suggested that these are first-class stock-feed, though every year thousands of meat, animals reach the abattoirs without having much of any other kind of feed. The non-technical descriptions and excellent illustrations will enable the various kinds to be readily identified.—A. D. W.

Salvia uliginosa. By A. Meunissier (*Rev. Hort.*, 1925, pp. 546-547; 1 col. plate).—*Salvia uliginosa*, a hardy perennial from Brazil, is well worth a place in the border. The foliage is aromatic and the shrub is covered with blue flowers from August to October.—S. E. W.

Sansevieria. By H. Jumelle (*Rev. Hort.*, 1925, pp. 383, 384; 1 fig.).—Much confusion has arisen from the fact that no less than four species of *Sansevieria* have been described under the name of *S. guineensis*, viz. *thrysiiflora* from South Africa, *abyssinica*, *metallica*, and *trifasciata*.—S. E. W.

Schizandra. By C. Leray (*Rev. Hort.*, 1925, pp. 449-450; 1 fig.).—This race of hardy climbing shrubs thrives in a light soil, in a sunny or partially shady situation. The Schizandras make slow growth at first, but later make rapid progress. Although the unisexual flowers are solitary, the fruit is borne in clusters. The most striking recent introductions are: *S. chinensis rubra*, with bright red flowers. *S. grandiflora* is remarkable for its very large pink flowers. *S. Henryi* has white flowers on long peduncles. *S. propinqua* is evergreen with white insignificant flowers and brilliant vermilion fruit in autumn. It is easily increased by budding. *S. rubriflora* is the most decorative of the race. It bears large tawny red flowers and handsome red berries. *S. sphaenanthera* has orange-red blooms and large ornamental berries.—S. E. W.

Stachys arvensis. By H. R. Seddon (*Agr. Gaz. N.S.W.*, vol. xxxvi. pp. 355-358).—Experiments prove that *Stachys arvensis* in the green, succulent state causes staggers in sheep.—S. E. W.

Thielavia basicola Zopf. **Perithecia and their Production.** By F. A. McCormick (*U.S. Exp. Sta., Conn., Bull.* 269, Aug. 1925, pp. 538-554; 3 plates).—This disease occurs commonly upon tobacco, where it forms perithecia. It is also found upon the violet and many leguminosæ.

The author has been able to obtain perithecia of this fungus in artificial culture media. It was found that the production of perithecia was greatly stimulated when *T. basicola* Zopf. was grown in association with *T. basicola* (Berk.) Ferraris., with which it is often found in nature.

T. basicola Zopf. is likewise stimulated to produce perithecia when grown with *Cladosporium fulvum*, *Aspergillus umbrosus*, *Thielaviopsis paradoxa*, *Saccharomyces cerevisiae*, and a water-culture of Taka disease.

A short bibliography is appended.—A. B.

Tomato Leaf-spot Mould (Cladosporium sp.). By Max. W. Gardner (*U.S. Jour. Agr. Res.*, vol. xxxi. No. 6, Sept. 1925, pp. 519-540; 5 plates).—A conspicuous black stem-rot of greenhouse tomatoes, caused by *Cladosporium fulvum* Cke., has been described by the author. The fungus has sclerotia and perithecia. In an infected fruit the fungus is found in the pericarp, locular walls, and placenta, in the torus, and often in one or more sepals, and the last internode of the pedicel. The mycelium grows down through the placenta and invades the seeds externally and internally. Sclerotia are often found near the hilum of the seed-coat. Under moist conditions the fungus sporulates on infected and contaminated seeds, and in germination the cotyledons must emerge through the infected area. A short bibliography is appended.—A. B.

Tulip-blossom Blight. By F. L. Stevens and O. A. Plunkett (*U.S. Agr. Exp. Sta., Illinois*, April 1925, *Bull.* 265, pp. 297-307; 7 figs.).—This disease causes tulip-flowers to wither and to become covered with a grey mould. The attack occurs just below the blossoms on the flower-stalk, and this causes the flowers to droop and wither. The fungus is a species of *Phytophthora* (*P. cactorum*), with a life-history similar to other species of *Phytophthora*. It occurs with greater frequency on the double blossoms, apparently due to the greater humidity.

The genus *Iris* is susceptible to the disease, and it can be induced on these plants by inoculation.—A. B.

Tulip Bulb-rot (Rhizoctonia tuliparum Klebh.). By H. H. Whetzel and J. H. Arthur (*U.S. Agr. Exp. Sta., Cornell, Memoir* 89, March 1925, pp. 1-14; 8 plates).—The bulb-rot in tulips has recently been reported in America by the authors and described as grey bulb-rot. They hold that the fungus differs from the *Sclerotinia bulborum*, and as a result of their experiments have placed it in the genus *Rhizoctonia* under the name of *R. tuliparum* (Klebh.), n. comb. Various control measures are discussed, but they hope that immune or resistant strains of tulip varieties may be obtained by cultivation and selection.

A short bibliography is appended.—A. B.

Tylenchus dipsael (Kuhn.) Bastian, Observations on the Biology of, and on the Occurrence of Biological Strains of the Nematode. By W. E. H. Hodson (*Ann. App. Biol.*, vol. xiii, No. 2, May 1926, pp. 219-228).—The biology of the stem eelworm is dealt with in a general manner, as the life-history of this species is similar in nearly all its numerous host-plants. The symptoms of attack, which include dwarfing, distortion, and frequently chlorosis, are described. Other points dealt with are the sources of infection and the method by which the nematodes enter their host-plant. The biological strain theory is described from field observations and experiments and controlled experiments carried out in cylinders.—G. F. W.

Weeds in New South Wales. By E. Cheel and R. H. Anderson (*Agr. Gaz. N.S.W.*, vol. xxxvi. p. 280; 1 plate).—Common Heliotrope (*Heliotropium europaeum*) is a free-seeding annual and is difficult to eradicate.—S. E. W.

Weevils (Curculionidae), On the Early Stages of Some. By A. W. Rymer Roberts (*Ann. App. Biol.*, vol. xiii, No. 2, May 1926, pp. 197-218; 24 figs.).—The early stages of most weevils resemble each other to such a degree that it is impossible to identify them from the descriptions found in textbooks. The author has made a detailed study of the larval and pupal stages of several species of Curculionidae, of which three are described in a preliminary paper, viz. *Phyllobius urticae* DeG., one of the pear-leaf weevils, *P. pyri* L., and *Polydrusus cervinus* L.

A short account is given of the biology of each species, and minute descriptions, together with figures, are given of the mature, larval, and pupal stages.—G. F. W.

Weight of the Seed, Effect of, on the Growth of the Plant. By David Schmidt (*New Jersey Agr. Exp. Stn., Bull.* 404, Nov. 1924, p. 19).—Plants of soy-beans, buckwheat, lima-beans, and maize grown from seeds of different weights. Seeds of high medium weight produced better plants than did seeds of lighter or abnormally heavy weight. The superiority of plants grown from heavier seeds over those grown from lighter seeds decreased notably as the plants approached maturity, sometimes disappearing entirely.—A. S.

Woodlice (Slaters). By M. B. Gurney (*Agr. Gaz. N.S.W.*, vol. xxxvi. p. 624).—Slaters, or Woodlice, collect under flat boards in damp places and are disposed of by dusting with sodium fluoride.—S. E. W.

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PLANTS IN THE EASTERN PYRENEES.

By T. ASHTON LOFTHOUSE.

NOTES from time to time in the gardening papers and an interesting paper by Sir ARTHUR HORT in the Royal Horticultural Society's JOURNAL on plants in the Pyrenees were probably responsible for my being in the Eastern Pyrenees with my friend Dr. J. W. H. HARRISON and his daughter, with various hints jotted down but without any very definite programme. A letter from a friend suggesting a likely hotel at Ax-les-Thermes set my thoughts in that direction, and we found ourselves in that lovely centre on the evening of July 25, 1925.

The River Ariège dominates the whole of an interesting district sandwiched in between the Haute Garonne and the Pyrénées Orientales known as Ariège and the inhabitants as Ariégeois.

The district includes a number of thermal stations situate along the higher parts of the Ariège or its various tributaries, at which there are numerous hotels and thermal establishments and usually a small and not very attractive Casino. On the lower reaches of the river are some interesting tourist centres, Foix, Pamiers and Mirepoix being among the better known. The whole district is interesting to lovers of nature and it includes many buildings of historical importance as well as being a centre of some of the caves or grottos famed for the remains of wild animals and the primitive prehistoric pictures that have been found in them.

We soon found that the vicinity of Ax-les-Thermes was a rich and interesting one, both for its physical beauties and botanically, the Ariège and its tributary the Orliège in the higher reaches running between high mountains, for the most part wooded almost to the top. A main road runs in the narrow valley cut out by the river, southwards up to Merens and eventually over the Col de Puymaurens, a principal road into Catalonia for Barcelona.

Our first investigations were made near at hand, along the road by the Ariège side towards Merens and alongside a pretty by-road which led up to Orlu by the Orliège. Within a few yards of our hotel a strikingly pretty *Viola* was found with good-sized yellow flowers without any trace of "honey guides" or "rays." This proved to be a form of *Viola tricolor*. It was seen during our stay in all parts of the district, and was almost without exception rayless; sometimes dwarf and compact, at others drawn and leggy, with flowers varying in size but mostly large, of all shades of yellow from sulphur to deep golden-yellow, deeper shaded towards the eye. Very rarely specimens were seen with the two upper petals bluish. The best forms—dwarf, compact, large flowered—would be a valuable acquisition for the garden, especially for those interested in the wild *Viola*. In Bonnier's *Flora of France, Switzerland, and Belgium*,* it is stated that there are of *Viola tricolor* 5 sub-species, 42 races or varieties, and 10 sub-varieties. Only the sub-species and nine varieties are described, and the form mentioned here does not appear to be referred to.

Dianthus Carthusianorum was frequent in suitable positions, generally on or about rocky outcrops above the roadside—long-stemmed clustered heads of deep crimson flowers very effectively thrown out horizontally from the steep rock faces. It is not nearly so fine for rock-garden purposes as the much dwarfer and more compact representative of this species seen in the Saas valley and other parts of the Swiss Alps.

Dianthus pungens occupied much the same positions, with inflated *Silene*-like sepals and small and somewhat ineffective rosy-pink petals. It is more interesting as a plant peculiar to the Eastern Pyrenees than as a garden plant. The Maiden Pink *Dianthus deltoides* was delightful, and varied considerably, having bright red flowers with and without the ring markings on the petals. Some of the flowers had the petals beautifully speckled with white at the base. *Dianthus monspessulanus*, a local form of this Pink, was very pretty, with pinkish fringed petals having a brown zone or ring on a white ground, very similar to a plant that I have had in my garden for some years.

A tall pink-flowered Thrift, *Armeria cantabrica*, was interesting as being a very rare species found in this part of the Pyrenees. Its stocky rosettes of radical leaves were peculiar in that they had alternately broad and narrow leaves.

* In course of publication. 12 volumes. Very fully illustrated in colour. Vol. I. issued 1912, Vol. VIII. in April last.

Campanulas included *Campanula lanceolata*, a form probably of *C. rotundifolia*, 12 to 18 inches high, with blue flowers, occurring only in the Central Pyrenees and Mediterranean. *C. patula* was as usual very lovely.

Cotyledon umbilicus must have been very beautiful in the bank sides and walls earlier, judging by the dry spikes now full of seed. *Brunella grandiflora* was a pleasant feature with its luxuriantly large bright blue flower heads plentifully produced on short stems and always effective. This flower is worthy of more use in our gardens, flowering later than the majority of plants suitable for the rock garden and over quite a long period. *Brunella alba*, a white-flowered form, was also seen.

Sedum hirsutum, a hairy grey-leaved Stonecrop not unlike *S. brevifolium*, had very beautiful white star-shaped flowers. It is a plant which includes the Pyrenees in a limited distribution and is a little plant well worth a place among the rarer plants on a select moraine. It was plentiful in the walls and bank sides by the roadways in this and other districts of the Pyrenees visited. Some small pieces brought back are growing quite well in the garden. Other Sedums noticed include *S. amplexicaule*, *S. dasyphyllum*, and *S. Telephium*.

Plants seen at the lower levels near Ax-les-Thermes included the handsome ferny-leaved *Senecio adonidifolius*, of which the Eastern Pyrenees is the principal locality, *Senecio Tournefortii*, another species special to this region, *Senecio Doronicum*, *Carduus defloratus*, quite an ornamental thistle with pretty foliage and magenta-red flowers, *Genista cinerea* on steep banks by the Orliège, and a dwarf *G. hispanica*-like shrub by the road from Ax to Hospitalet.

It was pleasant to see *Lathyrus sylvestris*, one of the dwarf everlasting peas, which is a welcome plant in some of our gardens. *Viola cornuta* was seen in flower, but only sparingly, quite pretty in its native environment.

The red-berried *Sambucus racemosa* seemed to be the wild elder about here, and was also noted in other parts of the Pyrenees visited. Such well-known plants were seen as *Jasione montana*, *Lactuca perennis*, *Verbascum Lychnitis*, and the pretty *Geranium pyrenaicum*, a native of many parts of England notwithstanding its regional name.

An early start by the auto-bus that runs daily from Ax-les-Thermes to Bourg Madame landed us at the summit of the pass over the Col de Puymaurens about ten o'clock. This allowed of a fairly long day's revelling among hosts of interesting alpine plants, many of which are peculiar to the Pyrenees. Many of the plants had never been seen before by me in their native haunts. The scenery by the route which is along the Ariège is magnificent. This river never seems to leave you in this region, and its name seems to be inscribed in large letters on all its bridges. The valley for the most part is narrow, flanked with steep mountains on either side, the lovely mountain torrent passing merrily along on its downward journey. At Hospitalet the pass is reaching the higher and steeper parts and entails some long zigzags to traverse the

steep gradient. There was very little chance of botanizing *en route*, although many interesting plants were seen on the wayside. It should be well worth walking for those who have the time.

By the steeper parts of the pass nearing the summit, where the rate of progress was slower, the tall flower spikes of *Gentiana lutea* with their whorls of yellow flowers were conspicuous in the mountain pastures along with the showy-leaved *Veratrum album*. The striking fluffy seed heads of *Anemone alpina* (possibly *A. alpina sulphurea*, which I understand from a friend who visited the district earlier was very fine) were prominent along with the bright orange large daisy flowers of *Arnica montana*, very beautiful poised on their slender stems, swaying in the breeze in the pastures, and *Rhododendron ferrugineum* (the Alpen Rose of the Swiss) on heather-covered mountain sides. The heath is *Calluna vulgaris*, and it was pleasant to find the lucky white heather, certainly the emblem of a red-letter day. The bilberry and the evergreen bilberry, *Vaccinium Vitis-idaea*, were also plentifully associated with it.

Bushes of *Daphne Mezereum* were seen locally, and *Rosa pyrenaica* with its lovely deep red flowers, the Alpine Rose of this region.

On alighting at the top of the pass we walked into boggy ground not unlike some that I am acquainted with in the North of England, the likeness being much enhanced by the absence of snow, very little of which remained at the end of July. The mountains in this respect are very different from the Swiss Alps, with their abundance of snow and extensive glaciers. We were soon among home plants—that is, plants that occur in the restricted area referred to, such as *Gentiana verna*, *Saxifraga aizoides*, *S. stellaris* with its lovely white stars, the pink-starred flowers of *Sedum villosum*, *Bartsia alpina*, our Alpine knot grass *Polygonum viviparum*, *Primula farinosa*, the Globe flower *Trollius europaeus*, and the lovely flowers of the Grass of Parnassus, *Parnassus palustris*, which we saw in every mountain locality visited during our stay in the Pyrenees.

With these few plants the plant likeness ended; the *Tofieldia* was *T. calyculata*, a somewhat larger plant than *T. palustris* in England, and the *Pinguicula* was the magnificent large-flowered *Pinguicula grandiflora*.

We had not been on the ground many minutes before we saw some of the lovely flowers of the Pyrenean Gentian, *G. pyrenaica*, quite a number, although evidently past its best, as many plants had their peculiar seed heads with seeds fully ripened lying in the opened-out "eye cup"-like receptacle. It is unquestionably one of the loveliest of the Gentians. Personally I should place it before *Gentiana acaulis*, but not in front of the brilliant blue stars of *G. verna* and its allies similar in flower. *G. pyrenaica* seemed to grow in damp grassy places on the watershed. Along the little streamlets were *Gentiana verna* and *Primula integrifolia*, one of the choicest of Alpine Primulas that I had not previously seen in its native habitat. Both these plants were in flower and also had ripened seed. Seed ripens quickly in these hot

high places, as it has to with a comparatively short period between summer and the long winter. Large numbers of plants of what appeared to be *Ranunculus pyreneus*, with larger and broader leaves, in seed, and which my friend suggested as being *R. gramineus*, were undoubtedly the larger-leaved *Ranunculus angustifolius* which had been seen in this locality in flower, white sheets of it, in June. Mats of *Azalea procumbens* were in the highest exposed parts. We also saw the dainty rose flowers of *Lychnis alpina* and an acaulis-like Gentian with creeping stoloniferous roots, long narrow leaves and large deep blue trumpets, which I take to be *G. angustifolia*, one of the more frequent large-flowered Gentians in the Eastern Pyrenees.

Geum pyrenaicum was seen in flower, a plant that I have had in the garden for some time, which is no improvement on *G. montanum* for garden purposes, and the quaint if not beautiful flowers of the Alpine coltsfoot *Homogyne alpina*, which I have never ventured on placing in the garden owing to unpleasant experiences with its near English relative. The vivid red flowers of the alpine clover, *Trifolium alpinum*, were very effective, and some white-flowered plants were seen together with the soberer flowered alpine *Trifolium badium*, with its long-shaped yellow and brown flower heads, probably the Pyrenean form *T. b. spadiceum*. These clovers are quite worth a place in the garden, although they would not come among the select fifty. The alpine snapdragon, *Linaria alpina*, always welcome, seemed to have much deeper blue flowers than usual, and in some instances without the bright orange lip, which, although odd, was quite pretty. *Leucanthemum alpinum*, the alpine chrysanthemum, occurred only sparingly, and some had deep claret-coloured flowers as well as the white. It is possible, however, that the coloured petals were due to the flowers going over, as I have experienced previously with *Pyrethrum radicans*, which was seen in the Sierra Nevada in a previous year, and plants raised from seeds resulted only in white flowers, until some when dying changed back into a magenta red. The vivid deep blue flowers of *Myosotis pyrenaica* were very attractive, though the plants being in a shaded position were not nearly so compact as some seen high up on the borders of Spain at a later date. *Myosotis pyrenaica* is, I believe, the same as *M. rupicola* that occurs very rarely in its North of England station. Soldanellas were frequent as plants past the flowering stage. The vivid deep scarlet flowers of *Dianthus barbatus*, interesting as the parent plant of the garden Sweet Williams, showed up well, poked through the deep green foliage of *Rhododendron ferrugineum*. *Biscutella auriculata* took the place of *B. laevigata* of the Swiss Alps, and was very dainty when dwarf as at the higher elevations. Phyteumas included *P. hemisphericum*, *P. spicatum* and *P. pauciflorum*.

High up some of the Veronicas were very beautiful, and included *V. bellidifolia*, *V. urticaefolia*, *V. fruticulosa*, with large rosettes and lovely gentian-blue flowers, and *V. alpina*. *V. spicata nana* was seen by the roadside on the way up from Hospitalet.

Working our way to a lower level by a gap in the mountain side formed by a stream draining the water from the watershed, *Primula hirsuta* was fairly plentiful in seed in the higher partly shaded sides. In similar positions and crevices were *Saxifraga aizoon* with its silver-edged very variable rosettes and white flower spikes, *S. geranioides* with densely tufted, bright green rosettes and large heads of white flowers, freely produced, and quite pretty, the dwarf compact and rare Eastern Pyrenean, *S. planifolia*, and various forms of *S. muscoides* and *S. decipiens*.

In the boggy places at the bottom of the ravine *S. aquatica*, a *Saxifraga* peculiar to the Pyrenees, was very effective with its vivid green rosettes and good-sized pure white flower heads carried erect on stout stems, masses of it being a lovely feature, as was *Ranunculus platentifolius*, a form of *R. aconitifolius* that is at home in similar wet positions, and the notably large-flowered *Cardamine latifolia*. Odd plants of the dwarf *S. granulata*, like *S. glaucescens*, were seen, one of the only two species of *Saxifraga* found in the Sierra Nevada, at the other end of Spain, in the previous year.

Coming out of this somewhat precipitous and rough track to the stream to which it connected and the more open valley, we found plants of *Primula intricata*, the Oxlip of these parts, the only *Primula* seen by me in the Sierra Nevada. The Birdseye *Primula*, *P. farinosa*, was quite at home in the boggy parts, along with a lovely *Gentian*, which was undoubtedly *G. bavarica*, although it does not seem to be a usual Pyrenean *Gentian*. It was found in wet positions similar to those seen by the lake at Mont Cenis. *Campanula linifolia* Scop. was collected, and has been verified for me at South Kensington. There is a good figure of the plant in Bonnier's "Flore de France," etc., Vol. VII. plate 382; it gives it as a form of *C. rotundifolia*, of which it enumerates 6 sub-species, 2 races and 14 varieties, the sub-species being described and figured. The Pyrenean Monkshood was fine locally, and the rare *Silene ciliata* special to the Pyrenees.

Lac Naguilles was visited the following day, starting from Ax-les-Thermes, at a little over 2,000 feet altitude, following the pretty valley of the Orliège, a tributary of the Ariège, by way of Orlu to Forge d'Orlu, at a height of about 3,000 feet. The Orliège was crossed here and the path followed by the Usine de Electrique up to Lac Naguilles, situate at over 6,000 feet, a steep, rough track, fortunately for a good distance in woodland shade, as it was hot climbing up at mid-day. It was too late for the woodland flowers, which had no doubt been fine earlier in the year, judging by the *Hepaticas*, *Hellebores* and other plants noticed. It was interesting to see a few large flowers of the Welsh poppy, *Meconopsis cambrica*, in a restricted area. *Luzula nivea*, one of the most graceful of grass-like plants, was a pleasant feature. The white-flowered *Saxifraga rotundifolia*, together with *S. cuneifolia* and the London Pride, *S. umbrosa*, were all fairly plentiful in the shade of the trees, as were masses of the pretty white flowers of *Circaea alpina*.

A view of a beautiful cascade of considerable height and volume was obtained about midway. After about three hours' steady plodding, the lake, which is one of the larger Pyrenean lakes, came into view, looking very lovely in the basin formed by the high mountains surrounding. It is one of a considerable series of lakes that reach from Ax-les-Thermes to within a short distance of Font Romeu, not far distant from the frontier of Spain, probably one of the wildest districts in the whole of the Pyrenees, and possibly not well worked botanically owing to its inaccessibility. The mountains and lakes of this part of the Pyrenees do not seem to be troubled much with visitors. The visitors, mostly French and Spanish, seem to spend most of their time near the "waters" or on excursions to places easily accessible by motor.

In the short time available quite a number of interesting alpine plants were seen by the side of the lake or on the mountain slopes adjacent. Many were seen at most places of a similar height and some not seen elsewhere.

The dwarf *Aquilegia pyrenaica*, the Alpine Columbine of the Pyrenees, with its pretty blue flowers, occurred very sparingly. *Astrantia minor*, the daintiest of the Masterworts, was in the high mountain pastures, as was *Astrantia major* by the side of the Ariège at the lower level near Ax-les-Thermes. *Rhododendron ferrugineum* skirted the lake in places, and in positions above *Erinus alpinus*, one of our prettiest, most useful, and easy alpinists, was plentiful and varied considerably, its reds ranging from pale rosy-pink to deep bright red. *Globularia cordifolia* ran along the bank sides, in considerable sized mats plentifully sprinkled with its pale lavender flowers. *Potentilla pyrenaica*, a very dainty yellow-flowered species peculiar to the Pyrenees, occupied positions similar to *P. alpestris* and was quite as beautiful in its mountain habitats. The red-flowered *Anthyllis Dillenii* is an improvement on *A. Vulneraria*, of which it is apparently a sub-species, a flower perhaps not outstanding but quite worth a place in the garden.

Primula integrifolia was in the boggy places, with *Soldanella alpina* near, and *Gentiana verna*, the latter usually on the tiny islands a little above the bog level. The Pyrenean form of *Epilobium montanum*, *E. Duriaci*, was seen, and *Ranunculus platanifolius* was a picture in its boggy environment along with *Saxifraga aizoides* and *S. stellaris*.

In the pastures above were the large-flowered *Gentiana angustifolia* and some lovely deep blue flowers of *Aster alpinus*; *Hippocrepis comosa*, the dwarf shrubby Buckthorn, *Rhamnus pumila*, *Teucrium aureum*, *Calamintha alpina*, *Allium Schoenoprasum* with its wine-coloured flowers, and the dainty little *Silene rupestris* with its white starry flowers freely produced in the drier positions. *Arenaria biflora*, a species that is not included in Bonnier as inhabiting the Pyrenees, was seen in flower.

Climbing up to some rocks well above the lake, we found locally a quantity of the loveliest of the Androsaces (except perhaps *A.*

alpina [*glacialis*]), *A. imbricata*, hard silvery hummocks wedged tight into the rock crevices, often well on the underside, so much so as to make one wonder how they obtained sufficient moisture to exist. Some had still the lovely white stemless flowers, but for the most part they were over, and many had ripened seed. This plant was not seen again during the visit. *Saxifraga Aizoon* was very plentiful, and some of the rosettes had very broad silver margins, very effective, much broader than any that I have seen in the garden. *S. caesia* or a form of it with its somewhat similar green hummocks was seen in similar positions to the Androsace. *S. sedoides*, *S. muscoides* and *S. pentadactylis* were on the ground at and near the base of the rock faces, with *Viola arenaria* in the shady positions.

In the stony screes was the striking alpine *Adenostyles albifrons*, with large grey leaves and Eupatorium-like flowers, last seen by me in the stony wastes of the Maritime Alps.

BOURG MADAME.

Bourg Madame is a motor run over the Col de Puymaurens from Ax-les-Thermes, with lovely scenery along the whole of the route. It stands at an altitude of about 4,000 feet, its buildings being placed along each side of the main road into Spain. Bourg Madame ends at the River Segre, which divides it from the much more interesting and older town of Puigcerda, the ancient capital of the Spanish Cerdagne. A single-span bridge connects the two countries, with the French Customs at one side and the Spanish at the other. There is considerable traffic, it being one of the principal roads into Catalonia for Barcelona, etc.

Arriving about midday, the afternoon was devoted to Puigcerda. The town is clustered up a hill-side about 350 feet higher than Bourg Madame. Its position makes it a prominent feature from the surrounding country, the view from a distance being more satisfactory than at close quarters.

The principal square and the older narrower streets near by are picturesque in parts, but somewhat squalid. The old church, l'Eglise St. Marie, has been badly mutilated, and is decorated in the awful way that seems to be rampant (unfortunately) in Spain at present. It has an interesting Gothic porch and some features of interest in the interior. A notice affixed to the lamp-posts first seen on entering the precincts of the town was interesting, as indicating that if followed it would lead to "English afternoon tea." We followed the clue, which led to the outskirts with no obvious signs of the actual rendezvous. Some French visitors were also evidently on the same quest and also in difficulties. Eventually a new building was seen in the middle of a garden some distance out which proved to be the establishment—a beautiful bungalow (hardly finished) with magnificent views, and English afternoon tea of the best. Many motorists come out from Ax

and other places in the short summer season, and no doubt this is the reason for its being provided in a place that hardly looks like supporting a decent café.

A stroll in the evening by the side of a tributary of the Segre revealed the interesting climbing *Cucubalus baccifer*, prominent with its Silene-like flowers. *Geranium pratense* was very beautiful in the meadows and by the stream side, the flowers mostly being a lovely pale blue, some almost sky blue, pure colours not purplish, and frequent all over this district, being quite a feature in the Val d'Eyne, and at Mont Louis later. *Saponaria officinalis*, much taller and bushier than usual, grew by the stream sides. This *Saponaria* is found in several British localities, but is not included as a true native in the London catalogue. The English names in Bonnier's "Flore" are interesting, "Farewell Summer" and "Gill-run-by-the-Stream." *Myosotis hispida* was in wet places by the roadside near the station, as were also some fine flower spikes of *Epipactis latifolia*.

Two visits were made to the lovely Val d'Eyne, a happy hunting-ground of famous French botanists in the past and noted for its rich and interesting flora.

The early train was taken to Bolquerre by the narrow-gauge electric railway, extraordinary for its serpentine twists and certainly one of the features of the district. Although the distance as the crow flies is not great, owing to the roundabout approach and heavy climbing almost the whole of the way the outward journey took over two hours. Flowers were very plentiful on the banks and the sides of the rocky cuttings *en route*—*Dianthus*, *Campanulas*, *Senecios*, including *S. adonidifolius*, etc.

On leaving the station a large expanse of moorland was crossed before the entrance to the valley was attained. In the wet grassy places the truly lovely *Gentiana pyrenaica* was very plentiful—large plants, some with flowers, but mostly in seed, some fully ripened. The seed head is very peculiar and different from any of the other *Gentians* I have seen. The flat, rounded ovary is pushed up above the corolla on a fairly substantial stalk. When ripened it opens out flat, exposing the seeds in a cup-shaped receptacle, from which the wind in due course will distribute them. It is quite different from the seed capsule of *Gentiana Farreri*, although the pushing up of the seed is probably somewhat on the same principle. It is curious that this *Gentian* has not been grown more in gardens hitherto. It may possibly be difficult to maintain over a series of years. Plenty of it has been distributed recently, and time will show whether it is as easy in some gardens as *Gentiana sino-ornata* [a failure with me up to now], and *Gentiana Farreri*, which does fairly well, but not at all comparable to the success in a famous Scottish garden.

Gentiana verna was growing in the same area, with large flowers on stems 5 to 6 inches high, doubtless the form known as *G. angulosa*, a stronger and larger *G. verna*, probably due to the nature of the subsoil. A similar large form occurs at Mont Cenís, where most of the flowers in

the same area are unusually large. I have had *G. verna* in the garden quite as large in flower raised from seed from British plants.

On the drier parts of this moorland waste *Genista anglica* and *G. sagittalis* were both abundant, the latter dwarfer at the altitude of about 6,000 feet and more suitable than it usually is for select places in the garden, where dwarf plants are the desideratum. A pretty lemon-coloured variety was seen.

After climbing up steeply through the fir woods beyond the moor and coming out into the open high up, some *Primula viscosa pyrenaica* with large serrated leaves were growing in and about the crevices in the large rock boulders, especially on the northern side. *Sempervivum arachnoideum* and *S. montanum* were on these rocks, and *S. tectorum* was seen in other parts of the district as well as the very pretty little *Sedum annuum*.

Dropping down by a steep, rough and stony track to the valley of the Eyne, large masses of *Rhododendron ferrugineum* were passed on the way, and more plants of *Primula pyrenaica* clinging to the rocks, with mats of *Saxifraga oppositifolia* near by. This was in flower higher up the valley, and included some of the deep red flowered Pyrenean forms.

By the banks of the stream on the return journey the graceful flowers of the Pyrenean Columbine were seen. On rising ground above the stream probably an area of half an acre of these dainty blue and white Columbines was a lovely revelation. Not so large as *A. alpina* nor possibly as fine, on 12- to 15-inch stems, much taller than one is led to expect by the descriptions. The dwarf flowered plants on 6-inch stems were seen at higher and less sheltered altitudes.

Some dwarf *Polygonum Bistorta* and masses of the white-flowered plumes of *Spiraea Aruncus* were noticeably picturesque by the stream side.

The Saxifragas included *S. aquatica*, *S. ajugaefolia*, *S. geranioides*, *S. planifolia*, *S. bryoides*, creeping about in the screes, various *S. Aizoon* forms and the small *S. granulata* like *S. glaucescens*. Higher up, on our second visit, the dainty flowered *S. androsacea* was noted in flower hugging the highest rocks up by the Porte de Nuria, also *S. nervosa* and various forms of *S. muscoides* and *S. caespitosa*.

Viola biflora was very plentiful in the shelter of the large boulders, running along the base and up into the crevices; the flowers were small and mostly whitish, not nearly so dainty as this dwarf *Viola* can be.

Some dwarf-growing *Campanula glomerata*, with beautiful pale blue flowers as well as the usual dark blue, and *Campanula spicata* were seen. The prettiest of the Vetch family were the dwarf large red-flowered *Vicia pyrenaica*, *Vicia onobrychioides* with lovely trailing deep blue trusses, and *Vicia bithynica*, the latter a rare British species. The Pyrenean *Eryngium Bourgati* was prominent in hot, dry places, and had the parasitic Broom Rape *Orobanche amethystinum* attached to it.

On the second visit to the Val d'Eyne much more ground was covered and a higher altitude attained up to and above the Porte de

Nuria, a pass leading into Spain. The track was missed on the way up, easy on these little-travelled passes, for a considerable distance over screes. The result was a very rough, steep climb over the loose stone slides. At the top we found that we were considerably above the level of the pass.

On the earlier part of the journey *Primula intricata*, the Pyrenean form of *P. elatior*, was plentiful in seed. *Adonis pyrenaica*, a well-known ferny-leaved early-flowering plant; the dwarf sweet-scented *Asperula hirta*; the ornamental herbaceous *Aconitum pyrenaicum* and *A. Napellus*; *Delphinium elatum*, a lovely dwarf including a dainty white-flowered form; and picturesque masses of *Polygonum alpinum* with its pretty white flower heads were all seen. The sweet-scented orchis *Nigritella angustifolia* was fairly plentiful in some of the high pastures. *Senecio cordatus* and *S. Tournefortii* were seen, and higher up in the screes the lovely silvery-grey mats of *S. leucophyllus* with deep orange flower clusters, a plant special to the Eastern Pyrenees, taking the place of *S. incanus* and *S. carniolicus* of the Swiss Alps, the two latter being included in Bonnier's "Flore" as sub-species of *S. leucophyllus*. *S. leucophyllus* has much larger leaves and is considerably larger in every way. The orange and yellow flowers of the Pyrenean Alpine Poppy also occupied similar positions. Masses of the silvery-grey leaved thistle *Carduus carlinoides*, with clusters of purply-red flowers, were very effective in the stony bed by the sides of the mountain torrent. In the same area, about 7,000 feet up, *Primula integrifolia* and *Gentiana verna* were in flower, with occasionally *G. alpina*, an exquisite dwarf with stemless blue trumpets, a gem for the moraine. *G. nivalis* with its clustered gentian-blue flowers was locally abundant.

Some pale lilac-blue *Linaria alpina* with bright orange-tipped lips were delightful, peeping out of the stony surroundings. On the steep higher scree slopes the plants while not plentiful included such treasures as *Thlaspi rotundifolia*, its flowers peeping out here and there, the somewhat similar looking plant, *Iberis spathulata*, and *Berardia subacaulis*, another rare Pyrenean species with large rosettes of whitish cottony leaves with a flat thistle-like stemless flower in the centre. *Ranunculus parnassifolius*, one of the gems of the family, had specially fine white and pinkish-white buttercup flowers. Above in wet places *R. glacialis* was frequent and flowering at its best, with large white and rose or claret-tinged flowers, with the daisy flowers of the prostrate *Chrysanthemum alpinum* near by.

At the top of the pass *Myosotis pyrenaica*, the Alpine Forget-me-not of this region, with its lovely dwarf hairy-leaved tufts jewelled with deep opalescent blue flowers, created an impression that will long be remembered. Two charming associates were the dwarf grey-leaved *Erigeron uniflorus* and *E. glabratus*, both with good lilac daisy flowers. *Azalea procumbens* was creeping about in the stony parts, in which were *Arenaria laricifolia* and the harder-leaved, larger-flowered and rarer *A. recurva* and the pretty dwarf *Jasione humilis*, which was past its best, going fast into seed.

In sheltered places were the ferny-leaved and rare *Dethawia tenuifolia*, *Androsace pyrenaica* and *A. carnea*, *Armeria alpina*, *Hutchinsia alpina*, and *Thlaspi alpina*. More in the open was *Silene acaulis* with pale pink, rose, and deep red flowers. Sheets of the tiny yellow flowers of *Potentilla minima* were a pleasing feature, as was *Gentiana nivalis* in the vicinity.

Astragalus included *A. glycyphyllus*, *A. monspessulanus*, *A. depressus* and *A. incanus*, the last being the prettiest.

In the hurried journey it was interesting to see the shrubby *Potentilla fruticosa* in one of its few scattered European localities, a shrub that I am familiar with in its English habitat. The Val d'Eyne plants were dwarfer and of much looser growth than in England. *Ononis stricta* grows in hot positions at a lower level. In the visits to the Val d'Eyne the orchid-like spikes of the Orobanches were seen parasitic on *Galium*, *Cytisus*, *Eryngium*, *Thyme* and *Ononis*, as well as Dodder strangling the plants of *Thyme* and *Cytisus*.

In the rush for the last train a short cut to the station was taken by the line side. Here a magnificent bell flower was seen with two very large blue bells beautifully poised on simple stems 18 inches to 24 inches high. It appears to be *Campanula Oliveri*, a very rare form of *Campanula speciosa*.

A day was spent in a charming wooded valley about 4 miles from Bourg Madame. It was reached by way of the Spanish villages of Aja and Villalovent. Owing to the vagaries of the frontier line in these parts, the wooded valley beyond these villages appears from the map to be in the French Pyrenees. An English entomologist working this district introduced us to this locality.

Sixty-five different species of butterflies, including two Parnassias or Apollo butterflies, were seen in the day. When it is noted that England has only about that number in all, it will be recognized what an Eldorado we were in. Where you have a large variety of butterflies there is sure to be a good variety of plants and many of special interest.

En route *Dianthus Carthusianorum* and *D. pungen* were abundant in hot, stony, exposed positions, *D. monspessulanus* in beautiful variety, and *D. subacaulis* and *D. subacaulis albus* in a restricted locality. The last had longer flower stems than usual, probably due to the hot position. Other plants were the pretty *Delphinium peregrinum*, *Armeria majellensis* with rose and white flowers, and two *Linarias*, *L. supina*, a procumbent plant with bright yellow flowers, and *L. striata* var. *galioides*, an upright-growing species with bluish-white flower spikes 9 inches to 12 inches high. The wooded valley had deciduous trees and conifers on the lower slopes by the stream, with conifers only on the higher, more exposed slopes. The lower positions by the stream had a rich undergrowth and many plants not seen elsewhere. The fine large and luscious wild strawberries that were ripe in this delightful locality proved tempting and unquestionably checked other botanical work for a time.

In the wood or by the stream side were the pretty white-flowered *Potentilla rupestris*, quantities of Columbines all in seed, too large leaved for *Aquilegia pyrenaica*, possibly the commoner *A. vulgaris*. Seeds were collected. *Primula suaveolens*, a Pyrenean cowslip, *Helleborus niger*, etc. were plentiful in seed. *Campanula speciosa*, a rare Pyrenean species, had beautiful clusters of large blue bells on 18-inch and 24-inch stems, very plentiful in parts but mostly going to seed. Much higher up in the open clear of the wood was an exquisite dwarf bell flower with large wide-open starry purple-blue bells, apparently the rare *Campanula caespitosa* Pourrett (*C. Pourrettii*), given in Bonnier as a race of *Campanula Scheuchzeri*. In boggy places fine large-flowered Globe Flowers were very effective. *Gentiana lutea* in seed, *Thalictrum angustifolium*, *Verbascum Lychnitis*, the yellow-flowered Foxglove, *Digitalis lutea*, *Aconitum Napellus*, *Veratrum album* and *Asperula tinctoria* were seen.

The dwarf shrubby *Vincetoxicum officinale*, *Cotoneaster tomentosa*, *Rhamnus cathartica*, *Genista scorpioides* in dry, hot positions, *G. tinctoria*, *G. cinerea*, *G. sagittalis* very plentiful, and the rare large-leaved procumbent *Salix grandifolia* were among the shrubs seen. About 7,000 feet up clear of the woods *Gentiana pyrenaica*, *G. verna* and *G. nivalis* were seen, the latter very plentiful in seed. The pinkish-red flowers of *Sedum villosum* were quite a feature in wet, boggy parts. In dry positions at the top of the pass *Jasione humilis* was abundant, but past its best, being burnt up and rapidly ripening into seed. *Alchemilla pubescens*, a hairy-foliaged dwarf, and *A. alpina* also grew there.

AULUS-LES-BAINS.

The next corner of the Pyrenees to be explored was Aulus-les-Bains. Aulus is some distance to the west of Ax-les-Thermes at the head of the River Garbet, a feeder of the Garonne. Although as a thermal station included in the Ariège district, it is really in the Haute Garonne.

To reach Aulus involved returning from Bourg Madame to Ax-les-Thermes and Foix, where the night was spent. Foix is the chief town in the department of the Ariège. The dominating features are the River Ariège and the old and picturesque Castle. The Museum near the Castle, although in a somewhat neglected condition, contains many things of interest, especially to archæologists, from the caves or grottos that are in this district.

In the few hours of our stay plants of interest on or about the Castle walls included *Antirrhinum Asarina*, *Linaria supina*, the pretty blue-flowered *L. origanifolia*, plentiful on the Castle walls, on which were *Dianthus Caryophyllus*, *D. plumarius* and quantities of the wild wallflower *Cheiranthus Cheiri*. An Orobanche was seen attached to the ivy. Search was made for the rare *Aethionema pyrenaicum*, but although not found by the Castle a single plant in seed was found in

another part of Foix. It was amusing to see two children searching the crevices of the walls by the Castle for snails. They had a long bent wire to extract them from the unreachable positions. They were presumably for edible purposes. Large and small shell snails and large black slugs we noticed all went into the collecting receptacle, and would no doubt eventually be served up in some high-class restaurant. Other plants included *Teucrium pyrenaicum*, a pretty white-flowered plant of *Delphinium Consolida*, *Senecio Cacaliaster* by the Ariège, *Asperula tinctoria*, *Oxalis stricta*, *Allium paniculatum*, and masses of the picturesque *Saponaria officinalis*.

On the way from Foix to St. Girons, the nearest station to Aulus, *Spartium junceum* was very plentiful in places on the railway banks. This is one of the most desirable of the larger Brooms for the garden, although liable to suffer in hard winters such as the last winter, when two out of three in my garden were killed. Two large well-established bushes, a feature in flower in a garden near, however, have come through only tipped. This Broom is best planted out of pots when potbound with the ball unbroken. Rabbits are very partial to these as seedlings, which I knew to my cost on first planting.

From St. Girons to Aulus is about 20 miles. A motor-bus was taken to Ouest, and from Ouest the steam tram which runs up the picturesque valley of the Garbet to Aulus. Aulus is situate at an altitude of 2,500 feet in a beautiful natural amphitheatre formed by high surrounding mountains. At this comparatively low level it is highly cultivated, and therefore less attractive botanically. Very little of interest was seen at the lower levels. It was only when the higher slopes were attained leading up to the Porte de Saleix, 6,000 feet, that it became interesting.

Of the plants in the vicinity of Aulus the Hypericums were the outstanding feature as compared with other parts of the Pyrenees visited. *Hypericum nummularifolium* and *H. Richeri* were particularly fine; others included *H. humifusum* and *H. hirsutum*. *Lactuca perennis* was noticeable with its clusters of blue daisy flowers, and *Lactuca tenerrima* was seen. Geraniums included *G. Phaeum*, *G. pyrenaicum* and *G. nodosum*. In the woodland shade Aquilegias were plentiful in seed. *Pinguicula grandiflora* was in the damp bank sides. *Jasione montana* with both blue and white flowers and the yellow-flowered *Jasione lutea* were occasionally seen. In drier open places by the track sides were *Teucrium pyrenaicum*, *Scleranthus perennis*, *Paronychia capitata*, *Asperula cynanchica*, and in higher parts the pretty *Asperula hirta* and *Erinus alpinus*, including white-flowered plants. In damp positions *Orchis ericetorum*, with *Nigritella angustifolia* locally in higher positions.

On the way up to the Porte de Saleix dwarf shrubs included *Daphne Mezereum*, *D. Laureola* and, higher up, *Rhododendron ferrugineum* and the interesting *Passerina dioica*. The dwarf willows were particularly interesting, including *Salix incana*, *S. pyrenaica*, *S. arbuscula*, and the prettiest of all creeping Alpine willows, *S. reticulata*.

Near the upper part of the pass interesting plants became much more frequent. In damp positions were the pretty flowers of *Primula integrifolia* and *Gentiana pyrenaica*, with *G. verna*, *G. nivalis* and *G. angustifolia* in drier places near.

The first Saxifraga of note was *S. aretioides*, plentiful in seed on and alongside outcropping rocks by the track side. *S. aizoides* and *S. stellaris* were in boggy places about the same level. Near the top were *S. oppositifolia*, *Dryas octopetala* with its beautiful white buttercup-like flowers, *Helianthemum canum* with pretty clusters of bright yellow flowers and a pale sulphur-coloured form, not so stiff or dwarf as the *H. canum* known to me in a very exposed position in the North of England. The English plant appears to be the *H. marifolium*, a rare form figured in Bonnier's "Flore." *Helianthemum vulgare* was plentiful in the same area, an interesting variety having a deep orange spot at the base of the petals with an orange crescent mark above.

In the green parts by the top of the pass the white flannelly flowers of the Edelweiss, *Gnaphalium Leontopodium* were seen for the first and only time in the Pyrenees and only very sparingly. As usual some bright blue-flowered *Aster alpinus* was associated with it. At this altitude *Aquilegia pyrenaica* was very dwarf, not more than 6 inches high, except a plant noticed in flower in the shelter of a pot-hole which would be fully 12 inches. *Ranunculus montanus* and *R. Thora* occupied damp positions.

In the shelter of the rocks at the summit the Saxifrages were specially interesting, including *S. Aizoon* in variety, the pretty rosettes of *S. media*, *S. caesia*, and what looked like the greyer *S. diapiensoides*, and various small mossy species, somewhat difficult to unravel in a hurried visit. *Potentilla alchemilloides* was particularly pleasing with its grey-green Alchemilla-like leaves and white-flowered clusters.

Sagina Linnaei and the rare local *Dethawia tenuifolia* and *Kerncra saxatilis* hugged the rocks.

Dry and more exposed positions had *Oxytropis pyrenaica*, *O. vulneraria*, *Erigeron glabratus*, *Arenaria purpurascens*, *A. ciliata*, a very rare Irish plant, *Ononis striata*, *Globularia cordifolia*, the interesting and rare *Berardia subacaulis*, *Phyteuma hemisphericum* including a white-flowered plant, and the Alpine Club moss *Lycopodium alpinum*.

CAUTERETS, GAVARNIE, WESTERN PYRENEES.

A desire to see the world-famed "Cirque de Gavarnie" resulted in the return journey being made via Bordeaux. Leaving Aulus, in the Eastern Pyrenees, we travelled by steam tram and motor-bus to St. Giron, and thereafter by tram to Cauterets, in the Western Pyrenees. Cauterets, as is usual in August, was very crowded, and owing to the difficulty in finding accommodation only moderately comfortable quarters were obtained. As we arrived after dark it was only in the morning that we realized the lovely position Cauterets, one of the most important thermal stations in the Pyrenees, occupies.

It lies in a lovely valley with steep mountain slopes on either side and beautiful vistas of the higher peaks in the background. A pretty mountain river, the Gave de Cauterets, runs through the town, tumbling down the beautiful valley beyond. A little above Cauterets it is joined by "feeders," mountain torrents coming down from the Lac D'Estom and Lac de Gaube, with beautiful waterfalls on their courses.

Our first morning, August 9, was devoted to visiting waterfalls on the branches of the Gave de Cauterets, the Cascade de Cerisey being extremely fine.

The vegetation by the river and in the shade of the steep mountain and rocky sides by the roadway was luxuriant and strikingly green. Near the electric station at Raillère the Cornish Heath *Erica vagans* was in flower. *Roseda glauca* was in a wall side near. This dainty flowered mignonette was also seen at Gavarnie later. It is a plant that would be quite an acquisition in the rock garden. The rosettes of *Primula viscosa* were plentiful high up on the rock faces by the road on the way up to the Ponte d'Espagne. In the shady places *Saxifraga Geum* and *S. umbrosa* were plentiful, and occasionally the pretty flowers of the useful *Viola cornuta*, daintier if anything in its wild and not overfed state. *Senecio adonidifolius* was seen, but only very little; it is much rarer than in the Eastern Pyrenees. The red-berried Elder *Sambucus racemosa* was plentiful, and a feature by the stream sides. In grassy places were the Pyrenean figwort *Scrophularia pyrenaica*, *Jasione montana*, and, in and near the rocks, *Sedum reflexum*, *S. album* and *S. anglicum*.

In the afternoon an expedition was made to the Lac de Gaube, which is within about 2½ hours' walk of Cauterets and situate at an altitude of about 6,000 feet. It was a beautiful walk the whole of the way, and many interesting alpine plants were found.

There was considerable traffic on the road up to the Pont d'Espagne. "Au confluent des gaves de Gaube et de Marcadaou terminant leur course par des chutes pittoresques, dans un site merveilleux," to quote a local guide. Crowds of Lourdes pilgrims come to Cauterets by charrs-à-bancs and walk or are conveyed to the Pont d'Espagne by mule-drawn vehicles. It was somewhat late in the afternoon when we commenced to climb the steep track from the Pont d'Espagne through the pine woods to Lac de Gaube. We met many visitors returning, some of them quite portly. Flowers seen *en route* included *Rhododendron ferrugineum*, *Antennaria dioica*, *Hypericum montanum*, *H. nummularifolium*, *Potentilla splendens*, *Silene ciliata*, *Dianthus deltoides* and *D. monspessulanus* with beautiful rose-coloured flowers with white zone. This pink was also very fine at Gavarnie.

The lake is in a lovely situation, having steep mountain slopes on either side and beautiful views of the high snow-capped mountain peaks to the south, dominated by the Vignemale, nearly 11,000 feet high, one of the highest mountains in the Pyrenees.

By the lake and on the slopes above were many interesting alpine. Among the Saxifrages were *S. Cotyledon* with very fine flower spikes,

sparingly, *S. groenlandica*, *S. muscoides*, *S. aretioides*, *S. caesia* sparingly, *S. Aizoon* in variety, *S. aizoides*, and the dainty *S. stellaris*. In the screes were the Alpine Toadflax *Linaria alpina*, the dainty *Erigeron alpinus* and *E. uniflorus* (both of which plants were seen later at Gavarnie), *Silene rupestris* and the deep yellow-flowered *Biscutella auriculata*. In boggy places it was interesting to see our native Bird's-eye Primrose *Primula farinosa* along with *Parnassia palustris* and *Bupleurum ranunculoides*. *Primula viscosa* was plentiful in the crevices of some large boulders with *Phyteuma hemisphericum* near, both in seed. *Sedum hirsutum* occurred hugging the rocks and *Sempervivum montanum* occupied the crevices. The Parsley fern *Allosorus crispus* was plentiful. Other species seen were *Trifolium alpinum*, *Alchemilla alpina*, *Phyteuma spicatum* and *Betonica salvifolia*.

One day unfortunately was all that could be spared to visit the Cirque de Gavarnie. We left Caunterets by an early train, by way of Pierrefitte to Luz station—a very pretty journey. From Luz a motor was taken up to Gavarnie, the mountain scenery, torrents and deep gorges *en route* being romantic and beautiful. The Pont de Napoléon, a single arch spanning a gorge on the way, is a bridge worthy of its lovely position, simple and beautiful in outline and not the eyesore that so many modern bridges tend to be. The view opened out on nearing Gavarnie is magnificent. The encircling steep mountain sides with waterfalls tumbling down the face (one of which is about the highest in Europe) and the snow-covered tops and ledges provided a picture ever to be remembered.

We were not the only visitors. Hundreds seemed to have come up by chars-à-bancs, mostly pilgrims from Lourdes with their attendant priests and guides. There was one long procession up towards the foot of the Cirque for a closer view of the magnificent waterfalls.

We early left the track and its occupants, spending the few hours available in working the higher ground on either side of the Gave de Pau. The river was crossed by a bridge a little above Gavarnie and the open ground, slopes, and woods worked on the east side. One of the earliest plants of interest was *Iris Xiphioides*, one of the wild Irises of Europe, with its stately blue flowers, interesting also as the forbear of the so-called English Iris, a well-known and welcome occupant of many of our gardens, and a sturdier and more reliable Iris for the colder and damper districts than the Spanish Iris. Working up a sheltered valley down which romped a lovely torrent revealed *Ramondia pyrenaica*, a plant that I had looked forward to seeing in its native haunts. Its rosettes were plentiful (though unfortunately too late for the flowers) in the rocky crevices facing north and also in the turf at the base. Some of the plants were in a parched, dried-up condition, but they would no doubt revive when the wet and snowy season set in. In the same rock faces large-leaved rosettes of *Primula viscosa* were plentiful, though in seed, some of which was collected. In the same area was *Androsace villosa*, with much larger rosettes than

any I have had experience of in the garden. A little of this plant brought back is still flourishing in a sheltered position on my little moraine. *Anemone Hepatica* plants were plentiful, some with lightly marbled leaves being especially noticeable. Sedums included *S. atratum*, *S. acre* and, sparingly, *S. hirsutum*. In the rock crevices or screes were *Sempervivum montanum*, *S. arachnoideum* and *S. tectorum*. *Saxifraga aizoon* was also plentiful and very variable, jutting out from the rock faces. *Pinguicula grandiflora* was in shaded boggy places, and in the more open the Grass of Parnassus, *P. palustris*, and *Saxifraga aizoides*, including the deep orange-flowered form.

In the irrigated meadows the Autumn Crocus of these parts, *Merendera Bulbocodium*, was opening out its pretty blue flowers, which a few days later would probably be a much more striking feature, tinting the meadows blue for a considerable area, as does its near relative *Colchicum alpinum* in similar positions in the Swiss Alps.

In the shade of the woods were *Potentilla rupestris*, a rare British plant, *Paris quadrifolia*, *Thalictrum macrocarpum* of the Western Pyrenees, *Rubus saxatilis*, *Saxifraga Geum* and *S. umbrosa*; in the open or by the stream sides *Aconitum Napellus* and *A. pyrenaica*, the latter especially fine with its picturesque yellow flower spikes, *Scrophularia pyrenaica* and *Jasione lutea*, and the pretty Pyrenean Sea Holly *Eryngium Bourgati*. Roses included the pretty little Alpine Rose *Rosa pyrenaica*, the red-stemmed *R. rubrifolia*—a very useful rose for the shrub border—and *R. coriifolia*. A white-flowered form of *Cuscuta Epithymum* was seen, the plant being parasitic on wild Thyme.

Recrossing the river, the stony and more exposed slopes on the western side revealed many plants peculiar to these more or less stony screes. Among these were the interesting but spitefully spiny mounds of *Astragalus aristatus* with its pale yellowish-white flowers, a type of plant more at home and much more plentiful on the high stony wastes of Southern Spain; *Adenostyles albifrons*, the white-leaved Butterbur, often the only large-leaved herbaceous-looking plant seen in the high exposed and desolate positions; *Gypsophila repens*, *Oxytropis pyrenaica*, the decorative deep rose-red flowered thistle *Carduus defloratus*, and a large group of flowering spikes of *Verbascum nigrum*, very effective with a rocky background. A belated flowering spike of *Cephalanthera rubra* was very beautiful in the shade of some Junipers, and *Orchis Fuchsii* was seen in another area.

It was too late in the season for many of the Gentians at the height we attained. One of the loveliest late-flowered species was seen—*Gentiana ciliata*, with its pretty fringed corolla of an uncommon shade of blue, described by FARRER as “a clear or stone cold electric blue, luminous and mute.” Unfortunately it appears to be hopeless in the garden, owing to its more or less biennial and possibly parasitic habit. Other Gentians were *G. nivalis* and *G. campestris*, the latter including white-flowered plants. Other plants seen in our fully occupied but happy hours included *Silene acaulis*, *S. ciliata*, *Teucrium*

pyrenaica, *Trifolium alpinum*, *Bupleurum ranunculoides*, the dwarf buckthorn *Rhamnus pumila*, *Cotoneaster tomentosa*, and the Pyrenean honeysuckle *Lonicera pyrenaica*.

In conclusion it may be of interest to mention that seeds of the plants mentioned below, collected in the Pyrenees in July and August 1925, and sown in November 1925, are only germinating now, April 1927: *Gentiana alpina*, *Gentiana verna* (three pots), *Gentiana pyrenaica*, *Primula viscosa pyrenaica* (2), *Phyteuma hemisphericum*, *Myosotis pyrenaica*, and *Saxifraga aretioides*, and *Jasione humilis* sown in January 1926. Unfortunately most of my pots of *G. pyrenaica* have been turned out, as well as some other species.

NOMENCLATURE OF GARDEN PLANTS. CHAOS OR UNITY?

By Dr. J. VALCHENIER SURINGAR of Wageningen.

NOMENCLATURE is a necessity in all kinds of matters, and not least in relation to plants: without names you cannot speak or write about them. At the same time it is a confusing thing, for the names of plants are many and troublesome. Whence comes this confusion? Practical men have always followed, and with reason, scientific Botany in naming plants. Plant names are binominal, the two words being generally derived from Latin or Greek, and an author's name follows and frequently also varietal names. This would be bearable if it were not that there are numerous synonyms and homonyms, originating in mistakes, misunderstandings, differences in the interpretation of plants and descriptions, or in the recognition of affinities. This confusion is probably greater among trees and shrubs than among herbaceous plants.

It is, of course, important that botanists and practical men alike should understand by a name the same species or variety of plant, and that they all call a species or variety by the same name. But what do we actually find? In catalogues of nurserymen one finds, for instance, *Abies* (a) including *Tsuga* and *Pseudotsuga*, or (b) including *Picea*, or (c) including *Tsuga*, *Pseudotsuga*, and *Picea*. If, therefore, you look at a name like *Abies alba*, it may refer to *Abies pectinata* (silver fir) or *Picea alba* (white spruce); *Abies canadensis* may be *Picea alba* (white spruce) or *Tsuga canadensis* (hemlock). In some catalogues *Picea* and *Abies* are kept distinct, but *Picea* is made to mean fir, and *Abies* spruce. The union of *Picea* and *Tsuga* makes it difficult to distinguish *Picea Albertiana* (*Picea excelsa* var.—) and *Tsuga Albertiana* (*Mertensiana*). *Larix pendula* might be *Larix americana* and *Larix europaea* var. *pendula*, etc.

Acer californicum of the catalogues means *Acer Negundo* var. *violaceum*, not *Acer californicum* Dietz. *Tilia europaea* is a Linnean name which mixes our *Tilia platyphyllos* and *T. cordata*: *Tilia alba* may stand for *T. tomentosa* or *T. petiolaris*. *Salix americana pendula* of the catalogues is *Salix purpurea*. Species are often confused with varieties.

It is the same over the whole continent of Europe and in America. No one country can blame another. Matters become worse because in different lands different names are used. In England we often find *Wellingtonia*, which on the Continent is called *Sequoia*; *Sequoia sempervirens* is sometimes called in England *Taxodium sempervirens*; and *Taxodium heterophyllum*, *Glyptostrobus heterophyllus*; and so on.

Many genera are taken in different ways in different countries, and even by different botanists and nurserymen in the same country; for instance, *Prunus* is taken sometimes in a wide sense and comprises

Cerasus, *Laurocerasus*, *Persica*, *Padus*, *Amygdalus*, etc., at other times it is used in a more or less restricted sense so as to include only *Cerasus*, leaving *Laurocerasus* and *Padus* as distinct genera. *Berberis* and *Mahonia* may be distinct or united; *Aesculus* and *Pavia* the same; and so on. It does not need to be said that varieties are named by all practical men with much liberty; one fears that advertisement more than precision is the moving spring.

It is not my intention to reproach the practical men with these imperfections; we all have them in different ways. You cannot expect a nurseryman to be a scientist too; nor a scientific botanist to be a practical nurseryman. Still it is important for both parties that there should be method and unity in the naming; and it is my intention to point out how we might get them.

In America a Joint Committee has published a list of "Standardized Plant Names" of species and varieties. It is followed there by a number of nurserymen. In most cases the "Joint Committee" follows the "Cyclopedia" of BAILEY, which itself is almost entirely based on the International Rules of Nomenclature (Vienna 1905, Brussels 1910). But the "Joint Committee" deviates in several cases from those Rules. It has *Larix laricina* (*L. americana*), *Cornus stolonifera* (*C. alba*), *Azalea japonica* (*A. mollis*), etc., but, in conflict with the International Rules, *Pseudotsuga Douglasii* (instead of *P. taxifolia*), *Larix europaea* (instead of *L. decidua*), *Acer dasycarpum* (instead of *A. saccharinum*), *Spiraea callosa* (instead of *S. japonica*), etc. *Carya* is called, in opposition to the Rules, *Hicoria*, though *Carya alba* is not the same species as *Hicoria alba*, etc.

Still the "Standardized Plant Names" remains a magnificent piece of work. But it is not able to bring about an international unity of nomenclature, for if personal sympathy or antipathy against names be introduced, every country and every person has its or his own preference in names. Unity can only be obtained by excluding all personal ideas and by following methodically and strictly International Rules.

In Holland there are about 1,500 nurseries of trees and shrubs. Nomenclature was, as in other lands, chaotic, and that caused trouble between nurserymen and buyers. First-rate nurserymen wished to put an end to that state of things and founded the Dendrological Society of the Netherlands, with a Committee for Nomenclature, of which I was elected the President. As I had since 1899 been connected with the Arboretum and the Science of Dendrology of the Agricultural Academy in Holland, I was conversant with the question. I advised the nurserymen to take for the basis of their nomenclature the International Rules and to have their catalogues corrected by the Committee for Nomenclature. A number of first-rate nurserymen did so, and the revolution of names was rather great. Anyone interested in such a modernized catalogue, which contains about 1,300 names of trees and shrubs, may communicate with H. DEN OUDEN AND SON, The Old Farm Nurseries at Boskoop (Holland); Mr. DEN OUDEN is also a member of the Committee for Nomenclature.

The foregoing is only intended to introduce the principal reason of this article, i.e. my hope for unity of nomenclature over the whole world of nurserymen. It seems looking a little too far ahead; but I think that psychologically the moment is favourable for such an enterprise. In September of this year there will be an International Congress of Horticulture in Vienna. Why could it not there be internationally agreed to follow in principle the International Rules, which with tremendous labour were achieved in that same Vienna in the year 1905? If that agreement is reached, then there is only wanted in every country a Committee of Nomenclature, who will assist the nurserymen in naming their plants in catalogues and nurseries according to the International Rules.

Yet there are complications.

First of all, there is the question of those genera, like *Berberis* and *Mahonia*, *Thuja* and *Biota*, which by one botanist or practical man are distinguished, but united by another. It is a question of affinity, so it cannot be subjected to rules by botanists; but the practical man will do good by making an international agreement, so that over all the world a *Mahonia* is a *Mahonia* or a *Berberis*, etc. In this case the "Joint Committee" in America has separated *Berberis* and *Mahonia* as two genera, and so did the Nomenclature Committee in Holland. But whilst that Committee in Holland separates also *Thuja* and *Biota* the "Joint Committee" in America has united them under the name *Thuja*, and so on. It would be well, therefore, that the Nomenclature Committee in every country should treat this question in the way the American and the Dutch Committees did and make up a list of all the cases concerned. Of course the result will be different in every country. To get international unity an International Committee is wanted, selected out of the Nomenclature Committees of the different countries; and that International Committee must gather the results above mentioned and make an international compromise. The list of genera so aimed at, distinguished or united, may be laid before the International Congress of Horticulture in 1930 in London; there a definitive list of genera can be accepted by a majority of votes.

Secondly, there are names of species which, according to the International Rules of 1905-10, are not legal, but which are unwillingly put on one side by nurserymen, for instance *Pseudotsuga Douglasii*. Each Nomenclature Committee may gather such desired names, and the International Committee may make up a list of results. That list may be presented to the International Horticultural Congress in 1930 (London); and there the list may be fixed by a majority of votes.

But the reader will say: That goes too far; you yourself have pleaded to hold to the International Botanical Rules. So I did, and I continue to do so. I do not mean that a Horticultural Congress will simply bring into use that list of desired (but illegal) names; my idea is that the Horticultural Congress will present that list to the International Botanical Congress that also is to be held in England in 1930. There may be deliberations between the botanists of the Botanical

Congress and the practical men (or their representatives) of the Horticultural Congress; but the International Botanical Congress has the right of decision about the names; if it refuses to put legal names on the list of the "Nomina rejicienda," such names must be retained by botanists and practical men; e.g. if the name *Pseudotsuga Douglasii* is desired by the practical men and their International Congress, but the International Botanical Congress refuses to put the legal name *Pseudotsuga taxifolia* on the list of "Nomina rejicienda," then our Douglas fir must be named *Pseudotsuga taxifolia* by all botanists and nurserymen.

Since 1905 many names have been rejected as being illegal, and legal names have come into use instead. The process is not yet ended. America, that has brought us so many surprises, brings us with each new botanical work new names instead of old ones. In modern books on trees and shrubs you find:

I. Under Conifers: *Pseudotsuga taxifolia* instead of *Pseudotsuga Douglasii*; *Tsuga heterophylla* instead of *Tsuga Mertensiana*; *Tsuga Mertensiana* instead of *Tsuga Pattoniana*; *Pinus Pinaster* instead of *Pinus maritima*; *Pinus nigra* instead of *Pinus Laricio*; *Pinus Mugho* instead of *Pinus montana*; *Larix laricina* instead of *Larix americana*; *Larix decidua* instead of *Larix europaea*; *Abies alba* instead of *A. pectinata*; *A. lasiocarpa* instead of *A. subalpina*; *A. Lowiana* instead of *A. lasiocarpa*; *Picea Smithiana* instead of *P. Morinda*; *P. canadensis* instead of *P. alba*; *P. Mariana* instead of *P. nigra*; *Larix Kaempferi* instead of *L. leptolepis*; *Pseudolarix amabilis* instead of *P. Kaempferi*; *Araucaria araucana* instead of *A. imbricata*; *Thuja plicata* instead of *T. gigantea*.

II. But you do not find all those new names in every work, i.e. in some works you find *Picea glauca* instead of *Abies canadensis* (*alba*) or *Abies Picea* instead of *Abies alba* (*pectinata*), or *Picea Abies* instead of *P. excelsa*.

III. Under Angiospermae you may find in modern works, e.g., *Populus tacamahaca* instead of *P. balsamifera* and *P. balsamifera* instead of *P. deltoides* (*monilifera*); *Betula pendula* instead of *B. alba*; *Quercus borealis* instead of *Q. rubra*, and *Q. rubra* instead of *Q. digitata*. *Ulmus foliacea* or *U. nitens* instead of *U. campestris* (*glabra*) p. p. (the other part as *U. campestris* or as *U. procera*); *U. glabra* instead of *U. scabra* (*montana*); *Aristolochia durior* instead of *A. macrophylla* (*Sipho*); *Parthenocissus vitacea* instead of *Ampelopsis quinquefolia*; *Acer cappadocicum* instead of *A. laetum* (*colchicum*); *A. saccharinum* instead of *A. dasycarpum*; *Laburnum anagyroides* instead of *L. vulgare*; *Lespedeza Sieboldii* or *formosa* instead of *Desmodium penduliflorum*; *Wistaria floribunda* instead of *Wistaria* (*Glycine*) *sinensis*; *Cornus stolonifera* instead of *C. alba*, and *C. alba* instead of *C. tatarica*; *Azalea japonica* instead of *A. mollis*; *Azalea mollis* instead of *A. sinensis*; *Symphoricarpos albus* instead of *S. racemosus*, and so on.

You see from the above (III.) that in one book you may find *Ulmus foliacea*, in another *U. nitens*, for the same species (part of *U. campestris*);

so with *Ulmus glabra* and *U. scabra*, and so on ; botanists do not agree in all respects as to what is the legal name. A good example of it is given by *Magnolia*. In Europe you find *M. denudata* instead of *M. obovata* (*purpurea*, *discolor*) and *M. precisa* instead of *M. Yulan* (*conspicua*) ; besides there is a *M. hypoleuca*. But in new American books you find *M. liliflora* instead of *M. purpurea* (*discolor*), *M. denudata* instead of *M. Yulan*, *precia*, *conspicua*, and *M. obovata* instead of *M. hypoleuca*.

Changes of names are always inconvenient, but most inconvenient and misleading are cross-changes ; among the foregoing you find examples in *Tsuga Mertensiana*, *Abies lasiocarpa*, *Populus balsamifera*, *Quercus rubra*, *Ulmus glabra*, *Magnolia denudata*, *M. obovata* and *Cornus alba*. In a cross-change a name is rejected as a synonym, but returns, in another meaning, in the place of another rejected name. The named examples are all one-sided cross-changes.

Is there only inconvenience in changing names ? No, the change depends in some cases upon better knowledge of names, and in others even on better knowledge of species described long ago. So, if it is right that LINNÆUS with his *Quercus rubra* meant the plant now called *Q. digitata*, then we must be glad to be able to restore a mistake of long ago, and take the inconvenience in the bargain.

But are all the names mentioned really the legal names ? You will ask me in return : How dare you ask such a question ? Botanists can know. Yes, they can ; but *do* they know in all cases ? Look at the lists above ; botanists do not always agree about the legal name ; one must be wrong ; and if a botanist can be wrong, they can be wrong in other cases altogether !

What is a legal (or valid) name ? It is a name that satisfies the Rules of 1905-10. You have only to see if a name is the oldest for the species, if there are no legal reasons to reject it, and if it is satisfactorily described. All that seems rather simple ; but it is often very intricate. To study the legality of a name you must have the original description of the species so named and also the original description belonging to competing names ; and you must judge those descriptions. Now, a description of, e.g., 1760 is not like a description of about 1900 and does not need to be likewise ; you must judge the description according to the time when it was made ; that is not always easy. And, after all, those original descriptions are very often very difficult to obtain. Therefore most botanists look only for the date of a name, and often take that date from other botanists ; and for the description they trust that other botanists have consulted it.

There is reason for investigating some newly edited names, and to make a study of all those names wherein botanists do not agree. In these cases the question is not always such that one botanist must be right, the other wrong ; but it is possible that both are right ! The Rules of 1905-10 are a brilliant work of Dr. BRIQUET, but are still not sufficiently elaborated in all questions. That was to be foreseen ; and it would have been better if in 1905 all the plant names had been

at once subjected to the Rules by a committee, and that the result had been accepted by a majority of votes at an International Congress. That has not been done; so it still must be done, at least for all debatable names. By that investigation it may be possible that a name now rejected as illegal will be demonstrated to be a legal name, and *vice versa*; you never can tell. And therefore that investigation must have taken place before the list of desired names of the International Committee of nurserymen is presented to the International Congress of Botanists; if names judged desirable to be held by the Committee are in the meantime proved to be legal names, then the International Botanical Congress will sooner adopt those names than without that investigation.

I made that investigation for a number of Conifer names; it is published in Dutch in "Mededeelingen" (Transactions) of the Landbouw-Hoogeschool (Agricultural Academy) in Wageningen, deel (Part) 30, Verhandeling (Transaction) nr. 2 (75 pages), with an Abstract in English. And it will be published in English in "Mededeelingen van het Rijks-Herbarium" (State Herbarium), 1927. Anyone who takes an interest in this study has only to communicate with the writer and he may have a copy.

In that study (where the original descriptions are always given) I come to a conclusion in several cases of competing names; my conclusion is, for example, that *Pinus maritima* is the legal name and not *P. Pinaster*; *P. montana* the legal name and not *P. Mugho*; that *Larix leptolepis* and *Pseudolarix Kaempferi* can be maintained (see above); and so with *Cedrus libani*, *Picea Morinda*, *Tsuga Pattoniana*, *T. Mertensiana*, and *Pseudotsuga Douglasii*. Another conclusion is that the legal name of our so-called *Pinus contorta* is *Pinus inops* (*Pinus inops* becomes *P. virginiana*), and the legal name of *Juniperus nana* is *J. sibirica*. Of course no one is obliged to accept these conclusions. It is my intention that the cases shall be judged by botanists (my study gives all necessary information) and that a conclusion shall be reached at the International Botanical Congress in London; the Congress may declare the name *Pinus inops* the legal name for what we understand as *P. contorta*, but put it on the list of "nomina rejicienda"; that way is safer than to declare a name not legal only because one wishes to get rid of it, for by so doing one creates a dangerous precedent.

I am making a study of some names of Angiosperm too; my conclusion for the present is that, for example, *Quercus rubra* and *Populus balsamifera*, *Magnolia denudata* and *M. precia*, in the customary sense, may be maintained, but that *M. obovata* is the legal name for our so-called *M. hypoleuca*.

In the third place there are the names of generic hybrids and of varieties. The International Botanical Rules reject names like *Laburnocytisus* and *Mahoberberis*. The International Horticultural Congress of Brussels has made its own Rule and legalized those names. I think this to be a practical Rule; but I think it a wrong method

that a Horticultural Congress makes its own Rules contrary to the International Botanical Rules; my opinion is that the Horticultural Congress will do well to present its wishes in this matter to the International Botanical Congress in 1930, and that the latter must take a decision; there may be deliberation between botanists and practical men between 1927 and 1930.

As to the names of varieties, the International Rules require one word, as with the names of species. Now, practical men (and many botanists too) wish to have names which indicate the principal characters of the varieties, e.g. *Fagus silvatica* var. *purpurea pendula*; besides there is a variety *purpurea* and a variety *pendula*; *F. silvatica* var. *pendula* could present a green pendulous, a purple pendulous, and a golden pendulous variety. Sometimes there are three words wanted, e.g. *flore albo pleno*, or *fol. arg. varieg.*

There is an outlet by putting a hyphen between the two or three words, but that is not according to the spirit of the Rule. The International Horticultural Congress of Brussels has approved double-word names, but it will be good to put that question again before an International Botanical Congress; the practical men may introduce a proposal. Mr. REHDER in his last work makes a solution in this way, that he puts the double-word name between quotation marks, e.g. var. "*purpurea pendula*." Sometimes one word has been made of two words; so *foliis variegatis* can be written *variegatus*; *flore albo: albiflorus*. *Acer palmatum* var. *linearilobum purpureum* is named by SCHWERIN var. *atrolineare*. Of var. *purpurea pendula* one could make *purpendula*; but in many cases it will be difficult and one will get a discordant name. This ought therefore to be another subject for deliberation; hitherto everyone has done what he liked. *International agreement is necessary to end the chaos of existing names of varieties and to make it possible to internationalize the denomination of new varieties.*

Besides this there is a great difference between so-called varieties. There are (1) "small species"; (2) varieties that are characterized by only one or very few peculiarities; (3) variations which are not constant; (4) so-called fixed juvenile forms; (5) varieties of a species are sometimes classed in sub-species, varieties, sub-varieties, etc. In a botanical work that wishes to express affinities and origins it will be necessary to distinguish all those kinds of varieties, but in horticulture I grant the habit of calling all varieties, variations, etc., varieties.

But still there may be a difference made between varieties and variations. The International Botanical Rules of nomenclature require for variations, forms, etc., fancy names, and forbid scientific (Latin) names. The International Horticultural Congress at Brussels confirmed this, and added that such fancy names must not be printed in italics, as is usually (but not always) done with scientific names. But the Congress allowed in some cases scientific (Latin) names. For instance, according to the Rules of that Horticultural Congress one is

allowed to write varietal names like *nanus*, *aureus*, *variegatus*, but not in italics.

There are a great number of varieties which are named after persons; we speak of *Populus deltoides* var. *aurea* v. Geert or *P. d.* var. *van Geertii*; the Horticultural Congress of Brussels does not allow the latter name.

As to *Picea pungens* var. *glauca* we may distinguish between seed-plants and cuttings or grafts of one specimen, e.g. of forma *Kosteriana*. Seedlings may be called, according to the above-mentioned Horticultural Rules, var. *glauca* (in italics), but one is not allowed to speak of var. *glauca Kosteriana* or var. *Kosteriana* or var. *Kosteri*; that must be var. *glauca* (in italics, because it means all blue seedlings together), f. *Koster*, or var. *glauca* (not in italics, because it means one special blue form), or var. *glauca Koster*. That again is a question to be deliberated between botanists and practical men.

A special case is where there are horticultural varieties of a botanical variety, as for instance *Cornus alba* var. *tatarica* fol. arg. varieg., *Juniperus chinensis* var. *procumbens* arg. varieg. How must we act here? If we put *Cornus alba* var. *tatarica* forma fol. arg. varieg., then this is inconsistent with horticultural varieties of other species; neither can the name var. *tatarica* fol.-arg.-varieg. or var. *tatarica-variegata* be recommended, because *tatarica* and *variegata* are so different in quality. There is an outlet possible by taking all "small species" as species, in our example *Cornus tatarica* var. *variegata*.*

All these questions and difficulties existing, it would not be wise to apply the rules of priority to varietal names before they are internationally and methodically settled.

There are other questions of second order, but of some importance. The International Rules of 1905 recommend to end generic and specific names, that are taken from names of persons, by a or ia, i or ii. Recommendations are not rules, so one writes *Nordmanni*, *Engleri*, another *Nordmannii*, *Englerii*, etc. It is also recommended but not ruled to write specific names with a capital letter when taken from names of persons or from generic names. So one writes *Aesculus Hippocastanum*, *Pseudotsuga Douglasii*, another *A. hippocastanum*, *Ps. douglasii*. Some persons write *Pyrus chinensis*, *Zanthoxylum*; others *Pirus sinensis*, *Xanthoxylum*; and that makes for the second and third names great difference in ranging species according to the alphabet.

REHDER, in his latest work on trees and shrubs, writes every name as it was written by the original author; but firstly no one can keep in his memory how the original name was written (*i* or *ii*, *a* or *ia*, *y* or *i*, *ch* or *s*, *x* or *z*); and secondly it gives an impression of carelessness if in one genus a name is written in a book or catalogue *chinensis*, in another genus *sinensis*. Better were it that the above-

* For other more intricate questions of this type see REHDER, "The varietal categories in Botanical Nomenclature and their historical development," *Jour. Arnold Arboretum*, viii. (1927), pp. 56-58.

mentioned International Committee made up its mind upon these questions, and formulated a proposal to the Congress in London in 1930.

In the fourth place we have the *author-names*. In most cases practical men do not use them ; but in some cases they are desirable ; for example, if a nurseryman has in his nursery a real *Picea Alcockiana* he will do well to write in his catalogue *Picea Alcockiana* CARR. (not HORT.) besides *P. ajanensis* FISCH. (*P. Alcockiana* HORT.).

As varieties will soon be treated methodically and there will be an international office, which will judge and fix new varieties, it will perhaps be useful that author-names are mentioned ; in *Populus deltoides* var. *aurea* v. Geert, v. Geert is already a kind of author-name. But if author-names are introduced for varieties (as botanists do in many cases) then there emerges a new question. With species it runs in this way : a species in a genus has an author ; but if a botanist takes that species out of that genus and puts it in another genus, then that botanist becomes the new author of the new combination. So, if a variety is taken from one species to another, it becomes another author-name, because the change of species means another complex of characters in the variety. For instance, if a botanist A distinguishes *Populus deltoides* and *P. canadensis*, and he does not agree with the combination *P. deltoides* var. *aurea* v. GEERT,* but takes it for *P. canadensis* var. v. GEERT, then that botanist A becomes the new author, so that it must be *P. canadensis* var. *aurea* A ; it may happen that Mr. v. GEERT does not like that change of name ! Of course one can make *Populus deltoides* or *canadensis* var. *van Geertii* instead of var. *aurea* ; and so in all other cases. But varietal names like *aurea* are very useful, because one can see the character of the variety. For such changes of names there must always be international agreement ; the change must be legal.

REHDER of the Arnold Arboretum goes still farther ; if the name of a species changes only because there is discovered an older name, so that the complex of characters of that species remains the same, then he (REHDER) changes all the author-names of the varieties of that species in the name of the botanist who gives that older species name ; for example, *Pseudotsuga Douglasii* CARR. var. *Fretsii* BEISSNER becomes *P. taxifolia* BRITT. var. *Fretsii* REHDER, because REHDER was the first who published that variety with the combination *Pseudotsuga taxifolia*. That principle causes a great many changes of author-names now and later, and in my opinion it does not follow from the International Rules of nomenclature. Deliberation is desirable, and an international agreement between all practical men and all botanists.

The International Horticultural Congress of Vienna can do useful work as preparation for definitive work in the Horticultural and Botanical Congress in London in 1930. What will English nurserymen do ?

* I am not sure if this variety was first published under this combination of names ; but it is possible, and it serves only as an example.

BULBS AND CORMS.

By Sir WILLIAM LAWRENCE, Bt.

THIS article has been submitted neither to Sir EDMUND GOSSE nor to Dr. STAPP. It is merely an expression of my ego, and as such a complete work of art. Highbrows may remember that when Monna Vanna—or was it Uncle Vanya—asked the waiter at the Central Hotel, Glasgow, whether “the French beans were fresh or canned,” the waiter replied: “The cauliflower was very nice.”

Bulbs and corms faintly suggest the chiropodist, so for the purpose of this article we will group them all loosely together as bulbs. There will be no reference to vegetables, and our only onions will be “ognons à fleurs.”

Bulbs may be described as horticultural camels, inasmuch as, owing to their internal organization, they can go a long time dry. They are convenient to dig up and to plant. They complete the cycles of their lives in seemly and decorous order; they do not have to rely upon seeds to prolong their existence, reproducing themselves by offsets and bulbils in a most attractive manner. In producing their leaves and flowers they show symmetry and balance, and are so completely artistic by nature that they can be used by artists in decoration without being stylized. Look at the picture of *Scilla hispanica* on the sixteenth-century Hispano-Moresque plate; “eradicated” but not “couped,” as our friends of the College of Heralds teach us to say (fig. 51).

These are a few reasons why I like bulbs better than other plants and why I always turn to the last pages of catalogues, where, under “Miscellaneous Bulbs and Plants,” I hunt eagerly for bulbs I do not know. This is good fun, but it is desirable to keep a sharp look out for synonyms. There is a Scotchman in Mexico who calls all his Calochortus Cyclobothrya, and I myself have been caught by a Bellevalia (*B. romana*—Roman Hyacinth); also go slowly with Alliums (especially in seeds from Botanical Gardens), as the dividing line between “ognon à fleurs” and “ognon” is drawn fine in this genus.

There is a strange attraction in plants whose names begin with “Z.” A friend of mine on Boxhill, debarred in a sentimental age from using the robust notice “Beware of man-traps and spring-guns,” has found the notice “Beware of the Zelkova” very satisfactory, and so I will introduce you to Zephyranthes, “The Flower of the West Wind.”

The most glorious Zephyranthes is *aurea*, a golden-yellow Amaryllis; it comes from Andean fastnesses in Peru and Bolivia, and is apparently not in cultivation. *Sulphurea* is a pretty thing which, mated with *can-dida*, gives a free-blooming hybrid “Ajax.” The white Zephyranthes

verecunda, which flowers in June, is the best. Each bulb produces three to four large flowers which open out flat like the star of eve. Next come "Atamasco," the Atamasco Lily from Mexico, a stronger-growing form of *candida*. All these white *Zephyranthes* set seed freely, which seed germinates exactly like mustard and cress.

The pink *Zephyranthes* are *carinata*, *intermedia*, and *rosea*. *Rosea* is a charming little thing, with bright pink flowers and short stems, and looks for all the world like a millinery *Crocus*; to flower the bulbs must be baked by exposure to sunlight. *Intermedia* answers to its name, while *carinata* not only throws noble deep pink flowers as large as a Daffodil but never fails to flower however it may have been tried. *Zephyranthes carinata* is known in India as the "Thunder Flower," and the dried bulbs sold in the bazaars are guaranteed to flower in three weeks. When Lord KITCHENER was in residence at Simla this *Zephyranthes* was often used to decorate the table. The pink *Zephyranthes* rarely sets seed, but we have succeeded in crossing *carinata* with *Cyrtanthus sanguineus*. Of the other *Zephyranthes* *Drummondii* has chestnut-coloured flowers on wiry stems, and *texana* is similar. These plants set seed freely. The white *Zephyranthes* are hardy, the pink ones rather less so.

The two *Cooperias* in commerce are nearly allied to *Zephyranthes*, and their union has produced in the hands of Dr. LANCASTER at Alipur a race of hybrids, *Cooperanthes*, which produce flowers like flat lilies much more freely than *Cooperia*. They grow easily from seeds or offsets.

The *Amaryllidæ* are interfertile. *Hippeastrums*, *Amaryllis*, *Vallota*, *Cooperia*, *Zephyranthes*, *Cyrtanthus*, *Nerine*, all cross with one another, as do other members of this family, *Crinum* and *Brunsvigia*.

Cyrtanthus includes a number of species with long tubular flowers opening wide at the mouth. We have raised a number of hybrids at Burford in all colours, passing from red through deep and light shades of coral and salmon to yellow and white. *Parviflorus* is deep salmon very like *intermedia* and *O'Brienii*. *Lutescens* is a clear yellow strong-growing species, whereas the plant generally shown under this name is probably a hybrid. There is a hybrid of this kind which rejoices in the specific name "*Haage-und-Schmidtii*." The glory of the genus is *sanguineus* from Natal, which has a long single flower like a lax *Vallota*, of a warmer tint with a suggestion of orange; this crosses with its own genus and with *Hippeastrum* and *Vallota*.

As a general rule *Cyrtanthus* should be kept growing and not dried off, and, if grown in pots, require annual repotting as they make an immense number of offsets. Exceptionally, *Cyrtanthus sanguineus*, which exists in a green and in a glaucous leaved variety, should be well ripened. And may I here emphasize the point that when I talk of ripening I mean drying off in sunshine; it is not so much the heat as the violet and ultra-violet rays which are effective.

The *Vallota* (named after Valot, although it is spelt with two l's) has given a very charming hybrid with *Cyrtanthus sanguineus*; it has

large loose flowers three and four to a stem, the colour of *Camellia reticulata*.

Nerines are so well known that I will confine myself to a few observations. First of all I think failure to flower is often due to too complete drying off; for instance, *Nerine Bowdeni* flowers much more freely and increases much more rapidly when planted out of doors than in pots. The white form of *Bowdeni* is easily the best white Nerine and the two hybrids 'Hera' and 'Aurora' sheer wonders.

In 1917 I bought some bulbs of *Lycoris squamigera* (NICHOLSON gives us the engaging fact that *Lycoris* was Mark Antony's mistress). Planted in a warm corner in heavy soil, they threw up their leaves regularly each year, and finally in 1926 produced magnificent spikes like a pale Belladonna shot with exquisite light blue. This gives me hopes that some day *Lycoris aurea*, *sanguinea* and *radiata*, which came to me from China via the Yokohama Nurseries, will flower. The explanation probably is that *Lycoris*, like some *Pancratiums*, does not flower until the bulbs have attained a considerable size. One *Pancratium*, *illyricum*, is quite hardy and is a noble spider lily which throws every spring three or four spikes from large bulbs. *Maritimum* is also hardy.

We have sported, however, long enough with *Amaryllis*, and we will go to Africa and look at a few of the African Irises, the *Moraeas*. This genus used to include all African *Irideae*, but for our purpose it shall include all *Dietes* and one other; that one other is *Iris pavonia*, which is also known as *Moraea* or *Vieusseuxia glaucopis*. This peacock-like, owl-eyed flower with rigid falls of palest blue and a black eye ringed with sapphire is easy of cultivation in pots. It should be allowed to root in light soil in a cold frame, and when the sheath pierces the ground the pot should be put on a shelf near the glass, where long grass-like foliage will be produced, from which ultimately in April the "Ulittjes," "little owls," appear. It reproduces itself rapidly, but only the larger bulbs can be relied upon for flowering.

NICHOLSON says *Moraea Huttoni* and *M. spathacea* are identical. The plant I grow as *spathacea* was given to me by Mrs. DYKES, and has very long leaves like those of a Spanish Iris. In the spring it throws up tall spathes with brilliant yellow flowers. A good grower, it increases rapidly. *M. Huttoni* has foliage like a Siberian Iris and throws up its spikes in the autumn; these are much shorter than *spathacea*, while the flowers are a deep yellow with a light brown mark at the base of the fall. *M. bicolor* is similar in growth, with very pretty primrose flowers and deep brown rings. *M. irioides* is a very interesting plant; the plant resembles a Californian Iris in general appearance, but in the type the growths run parallel with the ground. The flowers are pure white with a yellow and violet eye. There are two varieties, both of which have the upright habit and flowers twice (*Macowanii*) or three times (*Johnsonii*) the size of the type and differing from the latter in lasting a couple of days instead of being fugacious. *M. spathacea* and *bicolor* are the only really hardy ones; the others

exist but do not flower out of doors with me. Each strong growth produces a single spike, which must not be cut, as the flowers continue to appear throughout the year. *M. Robinsoniana* is an Australian plant with the habit of New Zealand Flax—tall spikes and large white flowers. It is not altogether hardy, and is best planted out in a cool house. Most *Moraeas* set seed freely.

Iris Sisyrrinchium is the charming little plant that covers the dry cliffs at Ronda and Taormina and other tourist resorts with tiny blue flowers from 2 o'clock P.M. to 4 o'clock P.M. I flowered them the next year after bringing them home, but never kept them longer. They can, of course, be grown in frames or pots, and are best raised from seed. An ingenious observer and precise gardener can set his watch by some of these flowers. *Cypella plumbea*, for example, opens its lead-grey flowers with their wonderful yellow markings precisely at 9 o'clock A.M. (summer time) and begins to fade at 10.15. This *Cypella* does wonderfully well at Burford, and we have had thirty flowers out at a time. Another useful *Cypella*, but not quite so hardy, is *Herbertii*, with orange flowers. *Homeria* is an attractive bulb which grows well and seeds itself everywhere in the Isles of Scilly. The terra-cotta flowers are like the feather posies of the Galleries Lafayette.

NICHOLSON says *Aristea* is more useful than ornamental. This is possibly true of *capitata* and *cyanea*, which have deep cobalt-blue flowers, but *Aristea (Wilsenia) corymbosa* is in a class by itself. This is a shrubby *Iris* with a woody stem expanding at the base, while in the autumn from each glaucous fan of leaves appear dense sprays of cœrulean flowers. The late Mr. ELWES had two immense specimens, and VEITCH of Exeter grows it well. It is, however, a difficult plant, and to propagate it worries even Edinburgh. Cuttings inserted in river sand strike, unless they damp off, in about twelve months.

This is almost enough for *Irideae*, but as we have been successful with *Iris Lorteti* the manner of cultivation may be of interest. Starting with an imported corm, this *Iris* should be potted in a well-drained mixture of leaf soil, loam and river sand, the corm being imbedded in the sand. The pot should be left in a cold frame until the leaf pushes through, when the plant is transferred to the shelf of a cool greenhouse and allowed to grow on rapidly (the leaves require supporting), moist but not too wet. The foliage dies down slowly after flowering, and the pot is then laid on its side in full sunshine and baked. In September the pot is shaken out and the new corms which have formed about the old ones potted up; the old corm broken in pieces and laid in river sand on a hot bed will often break.

Calochortus apparently means "beautiful grass," and the other name for this genus to which I referred previously means "circular bunch." Neither of these can be described as a triumph of nomenclature; on the other hand the local names are charming: Globe Tulips for the two that do not open their petals, the "Fairy Lanterns" *albus* and *amabilis*; Star Tulips for the Cat's Ears with their hairy interiors, *Benthamii*, *Maweanus* and *lilacinus*; the Mariposa Lily or

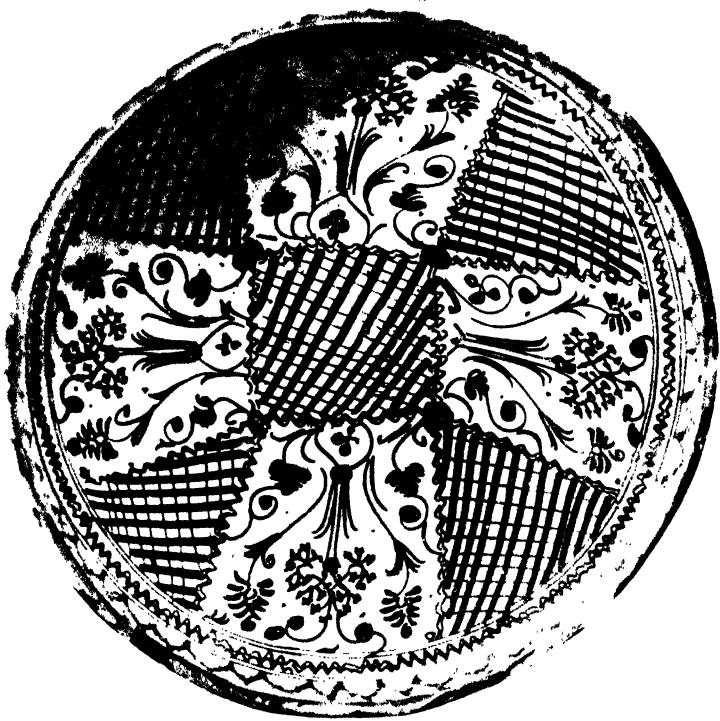


FIG. 51.

[To face p. 184.

Butterfly Tulip, *venustus* with its varieties 'Vesta,' 'Eldorado,' *oculatus* and *citrinus*. The Fairy Lanterns and Cat's Ears are woodland plants that grow over here quite well in the sun. The Mariposas, which follow the Atlantic coast from British Columbia to Old Mexico, like full sun. In this country they grow very well in a raised bed of perfectly drained light soil (sand or grit, leaf soil and loam). They are quite hardy, but must not be allowed to get wet during the winter. Accordingly they are grown best in a cold frame, the light being removed during fine weather. As soon as they have made their "grass" and begin to push their flower spikes, the light should be taken right off and water given freely. They are most exquisite flowers, and growing on tall wiry stems are excellent for cutting, inasmuch as they last very well. Besides the varieties of *venustus*, *odoratus*, *Leichlinii*, *Howellii*, *Plummerae* and *macrocarpus* can be obtained, and the last two especially are splendid growers, flowering in June. To keep the stock going requires skill, but the Mariposas readily set seed which germinates easily and flowers in three to four years. If the old bulbs are to be preserved, the flowers should not be allowed to seed and the bulbs should be dried off hard, no water being allowed to reach the plants in this process. However, before you send a large order to CARL PURDY for *Calochortus* you had better look up what FARRER says about them in "The English Rock Garden."

I should like to conclude these rambling remarks by a crossword puzzle of plant synonyms with a prize of, say, a bulb of *Brunsvigia Josephinae* weighing 6 lb. and producing a flower spike for all the world like an umbrella in a sou'west gale, for the solution; but I am afraid the Editor would frown. But I will let you into a secret. Since I read that *Babiana* is derived from "Babianer," the Dutch for baboon, in reference to the fact that these animals eat the bulbs, I have eagerly desired to put this to the test. Consequently we are raising a good supply of *Babiana* bulbs, and hope next summer to experiment at the Zoo on Monkey Hill.

GROWING BULBS IN BOWLS WITHOUT DRAINAGE IN FIBRE COMPOST.

By Mr. W. H. CUTBUSH.

[Read February 22, 1927.]

POSSIBLY there is no simpler, more fascinating, interesting or cheaper way of producing flowers than that of growing bulbs in bowls in fibre without drainage—all that is necessary is bowls which are watertight, bulb fibre, a cupboard, cellar or shed with a cool, even temperature, and good bulbs. Every amateur in the smallest dwelling-house can flower bulbs in this manner with certain success.

All bowls are suitable for some class of bulb. If they are only $1\frac{1}{2}$ or 2 inches deep they are most suitable for Crocuses, Scillas and Irises; if 3 to 4 inches deep for Hyacinths and Tulips, and if 4 to 5 inches deep, or more, for Daffodils. If more than these depths so much the better. They should not have holes in them at the bottom, and should be watertight. No injury is done to the bowl by this use.

The fibre can be any of the recognized bulb fibres, which are composed usually of either coconut fibre, peat moss litter rubbed through a $\frac{1}{4}$ -inch sieve, or finely chopped loose peat mixed with charcoal and crushed oyster-shell. Charcoal is most essential to keep the material sweet. The proportion is $1\frac{1}{2}$ bushel of fibre, $\frac{1}{2}$ peck crushed charcoal, and 2 quarts of crushed oyster-shell. This when used should be nicely damp but not soddened. If it is dry it is most difficult to get damp, and if over wet it is liable to be put into the bowls over firm. Potting soil must not be used.

Crocuses possibly do better in silver sand than in fibre, and some of the Irises, especially *Iris persica*, also do better in sand than in fibre.

The bulbs should be best quality—those which are advertised at very enticing prices are usually disappointing. They are often too young to flower properly or are not the kind whose name they bear.

In filling the bowls the fibre must not be pressed in tightly—if it is made very firm the bulbs will push themselves out of the bowls. Sufficient fibre should first be put into the bowls to ensure that when filling is complete the fibre comes to about $\frac{1}{4}$ inch below the edge of the bowl, and the nose of the bulbs just above the edge. The bulbs should be buried in the fibre so that just the nose is above the fibre, about half the bulb. They should be thoroughly well watered, and so as to remove any surplus water after filling the bowls should be turned slightly on their sides, so that any surplus moisture will run out. For Crocuses, etc., in sand, fill in the same manner.

The bowls should then be put into their dark quarters and left for at least three months. The later-flowering bulbs will require a much

longer period. They should not be brought out from the dark quarters before the bulbs have made an inch or more growth. During the time they are in the dark they should occasionally be attended to and watered, and the bowls turned so that the same side does not remain in the one position. One side of a building is often warmer than another. The number of times of watering will depend upon the place in which they are being kept. It is advisable to examine them at least every two or three weeks. They should never be allowed to get dry, and after watering tip them on their sides to remove surplus water.

A suitable place in which to keep the bulbs whilst they are making root growth is any cupboard which is quite cool and quite dark. If no dark place is available, the bowls can be put into a box with a lid on, or curtains hung in front to keep them dark. It is most essential that the place be absolutely dark, frost-proof, and not in any way warm. The temperature should be even. It is not advisable to put them outdoors and cover them in the way bulbs are grown in flower-pots, as they become waterlogged.

When they are taken out of their dark position they should be brought into the light gradually, and never be put into a bright light at first—it is advisable even when they are in flower to keep them out of the direct rays of the sun. They should be turned each day, as they grow towards the light, and if left unturned will lean towards the light and open unevenly.

All planting should be done if possible before the end of November—the longer the bulbs are left in the dark the better rooted will they be and the better the flower from this perfect rooting.

Some of the most suitable bulbs and the ordinary times for flowering without heat are :

Roman Hyacinths for early flowering ; these can be had in flower by Christmas.

Italian Hyacinths ; these will be in flower in January and early February.

Prepared Hyacinths ; the large size and the miniature will flower about January—February.

Hyacinths will flower from February onwards.

Tulips, early single varieties, will flower, according to the sort, from January to April.

Tulips, double, flower from February to April.

Tulips, Darwin and May-flowering, end of February onwards.

Daffodils, according to the sort, from January to April.

Crocuses from February onwards.

Other bulbs which can be flowered in this manner are :

Winter Aconites

Chionodoxas

Scilla sibirica

Muscaris

Snowdrops

Fritillarias

The most simple to flower are Hyacinths of all sorts, Tulips, Daffodils and Crocuses.

No feeding is required, but should bulbs at any time be short in growth then just a little sulphate of ammonia, not more than a tiny pinch, put into a quart of water and used for watering, is all that is necessary.

The chief failures are caused by planting bulbs over-firmly; keeping in a place which is heated or warm, or where the temperature changes; allowing them to become dry; and taking out of the dark before they are thoroughly well rooted. The last is the most frequent cause of all.

If it is desired to get the bulbs into flower earlier than if grown in the natural way, they can be placed in a warm greenhouse or in a warm room. To have them in flower by Christmas or January this is almost necessary.

For forcing they should not be taken from their dark quarters and put straight into heat. It is better to take them into the warm place by degrees.

Over-forcing is liable to cause failure.

Watering must receive every care from beginning to end, for once they have been allowed to get dry some injury will have taken place and spoil the result.

A support for the flowers and foliage is often necessary; a stiff wire is the best, and a neat tie of thin green raffia or soft string.

A little green moss to cover the fibre when the bowls are to be used for room decoration is a great improvement and will do no harm.

The advantages of growing bulbs in this form are that they can be grown by anyone without glass houses; they are established in the bowls which are wanted for decoration purposes and have not to be turned out and transplanted. The bowls being watertight can be placed on a polished table or on the most delicate table-cover.

Where greenhouses are available, after taking out of the dark the culture is the same as for bulbs grown in soil in the ordinary way; the only difference is the watering, which must be attended to as suggested.

The number of bulbs to be put in a bowl is a matter of taste. They can be put in touching one another or apart as desired.

SPRING FLOWERS FOR SMALL GARDENS.

By W. H. DIVERS, V.M.H.

I WILL treat this subject under three heads: (1) Plants that can be removed after flowering; (2) Plants that should remain at least three years before removing; (3) Hardy spring-flowering shrubs.

Division I.

The Aubrietias are placed first. They possess such a wide range of colour and produce a mass of flowers when grown properly; they are easily increased by division and by cuttings, and are not difficult to please in the matters of soil and situation, provided they get a fair amount of moisture at the roots, in all seasons. It is important to remember that they make very few fibrous roots, and require the greatest care if they are removed between the middle of April and the middle of October. It is possible to preserve them by planting in a place where the sun will not reach them before the middle of the afternoon, and in the dry weather they should be sprayed over every evening; even then they appear to die, but eventually push out green leaves, and may be placed in the open in October; plants that have been treated in this way are excellent for increasing the stock in the following spring. A piece of firm ground that has been dug over several weeks previously is best for them; early in March, as soon as severe frosts are over, is the time for dividing up these old plants. Lift the plant with a fork, and pull it in pieces. Place two or three rosettes of leaves together with the long old stems attached, in rows 1 foot apart and 9 inches between the plants. Make very firm, and scarcely any attention will be required, beyond weeding and surface stirring, until the following October, when they should be compact plants 6 inches across, and will be ready for the position where they are to flower in the following spring. They may also be increased by cuttings put in during June or July, under glass; these require careful shading, and will not make such good plants as those raised by division.

All the Aubrietias are suitable for growing as more or less permanent specimens on low walls or on rockwork. Visitors to Wisley will remember the fine masses that used to grow on the rockwork there some years ago, also the plants at the present time on the wall near the main entrance. There are many fine varieties. The species *A. deltoides graeca* bears a small flower of a pale blue colour; it is the earliest to flower. A golden variegated form of it is valuable as an edging plant. The crimson variety, *A. Leichtlinii*, is still one of the best if obtained true to name. Some stocks of it are not true, as none of the Aubrietias come true to colour from seed. This was raised

by MAX LEICHTLIN, curator of Baden-Baden Gardens, who sent it to England about the year 1890; 'Fire King' is a deeper crimson, and lately a new variety named 'Magnificent' has appeared; this is the largest flower amongst the red shades. *A. Moerheimii* is a good pink variety. 'Lavender' is the best pale blue. 'Mrs. Baker' is a darker blue with a white eye; 'Blue King' is also a good variety. 'Duke of Richmond' is a fine reddish-purple colour. The variety generally found is 'Dr. Mules.' This is a good Tyrian purple, but is excelled by *A. Hendersonii*, which is similar in colour and has a much larger flower. There are many others of various shades, most of which are worth growing, with the exception of the so-called white one, which is not good. Where these plants are removed after flowering it is a good plan to dot in bulbs of early-flowering tulips between them, when they are planted, early in October; the Aubrietias should be put in first and made firm, then the tulips may be placed in position about 1 foot apart each way, and afterwards planted 4 inches deep with a blunt dibber. This is the plan for planting tulips or other bulbs among all dwarf plants; for taller plants, such as wallflowers, the tulips or other bulbs should be planted first and marked with a short stick, the wallflowers to go in before the sticks are removed.

Violas.—Many of these are free flowering, but do not come early enough to include in the general spring display. The variety 'Maggie Mott' has become everybody's favourite; another one—'John Quarton'—is almost identical in colour, much more compact in habit, and is often confused with it. A large quantity of this variety grows at Wisley in the Rose borders. 'Ardwell Gem' is a good early yellow variety. 'Skylark' is blue and white—a strong, early-flowering variety. 'Countess of Hopetoun' is pure white. *Viola gracilis* and all its varieties are early flowering, but require closer planting than other kinds, as they do not make so much growth. Many other kinds of *Violas* are frequently exhibited; the majority do not flower early enough to give a display in April. Cultivation of all the varieties is quite easy. They can be increased by division in June, when flowering is getting over; also by cuttings, which spring up from the base in September. These root freely in the open if the soil is enriched by decayed leaves; the old plants often give better results the following year if allowed to remain in position. In such cases they should be trimmed round closely with a knife in September, and will make a fresh growth from the base; during dry summer weather a good soaking of water is necessary. It is a good plan to dissolve sulphate of ammonia in this at the rate of 1 oz. to the gallon. The double Violet, 'Lady Hume Campbell,' is hardy enough, and may often be grown in sheltered positions if there are overhanging evergreens; it is always appreciated in spring.

Phlox divaricata, also known as *P. canadensis*.—This plant requires more care than those we have mentioned, but it is one of the best when well grown. A form called 'Ladham's Variety' is often exhibited, but is not so good as the pure lavender-coloured variety.

When grown well this gives a mass of flowers about 7 inches high, of delicate form and colour. These are sweet-scented, and last a considerable time in good condition ; one great point is to grow the plants well after the flowering season is over. They like plenty of decayed leaves or old strawy manure in the soil. Being such a good thing, slugs and snails are very fond of it, as are rabbits and hares. It is increased by cuttings from the base after flowering is over ; these should be gently pulled away and put in with the heel attached, under a handlight, in a shady position. It may also be increased by division of the rootstock after flowering is over. Another Phlox, called 'Newry Seedling,' is always much admired when seen as a mass of flowers in the spring. This one is only 3 inches high, and is a very pale lavender in colour. Like the previous one it is easily grown and may be increased in the same way. Many other dwarf Phloxes, such as *P. reptans*, *P. amoena*, and all the varieties of *P. subulata*, are excellent for this purpose, but for small gardens a large number of varieties is not required.

Polyanthus.—If selected true to colour and grown well these give large masses of flowers in spring. Both the white and yellow kinds may be raised true from seed, if care is taken in keeping the flowers from cross fertilization. Some of our seedsmen supply excellent strains of seed. It is not easy to keep the old plants alive if they are removed after flowering is over, and young plants give the best display. The quickest way is to sow the seeds early in February under glass in a warm temperature ; the young plants must be gradually hardened to outdoors, and planted in a shady position early in April ; or seeds may be sown in pots as soon as ripe and kept in the pots until the following March, to be then transplanted into a shady position. All plants of the common kinds of *Polyanthus* and *Primrose* like shade from hot sunshine, moisture at the roots, and decayed leaves or other vegetable matter to grow in ; the double forms of *Primrose* are difficult to grow in the south of England, but are valuable in cool, moist districts. Other species of *Primula* such as *P. japonica* and its varieties *P. rosea*, *P. helodoxa*, *P. pulverulenta*, and others are magnificent in a partially shaded position intersected by streams, where the soil contains plenty of humus. These may be seen in perfection at Wisley, and at Coverwood, Ewhurst, but few small gardens have the natural advantages which these places possess.

Saxifrages.—Great improvements have been made in the mossy *Saxifrages* during recent years, both in colour and in the size of the flowers. They are easily propagated by division ; a small portion put in very firmly in good ground early in May should be 4 inches across in October. *S. bathoniensis* is one of the best varieties ; *S. 'Guildford Seedling'* is darker in colour, and *S. 'Beauty of Letchworth'* is a fine large red variety.

Division 2.

Anemone fulgens.—This is one of the earliest to flower, and is often in bloom before Christmas. It likes a warm, open position, and should remain there for several years. The time to increase it is when the leaves turn yellow, about June. Dig it up, and dry the roots in an open, airy shed; when they get in a shrivelled state break them in pieces the size of hazel nuts, and plant them early in August on ground that has been manured and dug some few weeks previously. The roots should not be more than 2 inches deep and may be spread about 4 inches apart. Another good early Anemone is *A. Robinsoniana*. It is really a pale blue variety of *A. nemorosa*, our common wild Anemone. It may remain for ten years if it grows well, and is suitable for an open position on rockwork, where it will get a fair amount of moisture.

Gentiana acaulis.—Everybody's favourite when it does well, but so many complain of failure. It likes a retentive soil, and with care in planting it soon establishes itself and does well. The best time for planting is as soon as the flowers fade. Divide old plants into single pieces, retaining all the old stems and roots. Make the soil firm, plant with a dibber 2 inches from each other, press the soil closely around them, and put a thin layer of $\frac{1}{4}$ -inch granite or broken burnt ballast over the ground after planting. As soon as severe frost is over in spring tread all over the plants to make them firm. This plant likes rich soil and full exposure to the sun; it does not succeed well on sandy ground.

Iris pumila.—At one time considered almost impossible to keep alive in this country, it may be grown successfully by giving it an open position, planting firmly, and leaving it four years without disturbing the roots. All the varieties are worth growing. *I. p. coerulea* is the chief favourite. It likes a rich, retentive soil, and should be replanted as soon as flowering is over after the fourth year; care is necessary at all times to keep it free from weeds.

Narcissi.—These are general favourites and comprise some of the best flowers for naturalizing among rough grass, but are not suitable where the grass has to be mown short, as the leaves should not be injured while they remain green. Some varieties will last many years in good condition if planted 6 inches deep. They should be placed in fair-sized, irregular-shaped clumps, not dotted about singly. The old kinds such as 'Emperor,' 'Empress,' 'P. R. Barr,' *Barii conspicuus*, 'Sir Watkin' and concolor 'Autocrat' are some of the best for this purpose. Many of the newer ones, including 'King Alfred' and 'Golden Spur,' fail after the first few years; in wet positions *N. Bulbocodium* and *N. cyclamineus* naturalize easily.

Auriculas.—These are not showy flowers, but repay one for close inspection and are very sweetly scented. They like partial shade and plenty of moisture at the root. The plants may remain in position for five or six years if top-dressed with leaf mould. When too large they

should be split up after flowering is over. They are also easily increased from seeds, which should be sown as soon as ripe, in a pot or box ; the soil should be made firm, and then watered ; leave it half an hour, then sow the seeds, cover closely with glass until the young plants appear, when air must be admitted, and increased gradually ; if water is required the pot should be placed in a bucket so that the rim remains just above the water.

Division 3.

The small garden is not complete without a few flowering shrubs. They may be used around the sides for shelter, when evergreens will be necessary. *Berberis Darwinii* forms a good hedge, and flowers if not cut closely. *Berberis stenophylla* is also suitable. The general favourite—Privet—should never be planted ; it exhausts the surrounding soil and requires too much cutting. Where Rhododendrons thrive they cannot be surpassed as flowering evergreens. A selection of varieties can be had to give flowers for six months. Deciduous flowering shrubs give a wide range for choice ; some grow too freely for a small garden, and eventually take up too much room. *Magnolia Soulangeana* is compact, free flowering, and sweetly scented ; *Magnolia stellata* is also desirable. *Cydonia Sargentii* is the best of family ; it is very bright red in colour and compact in growth. If any walls or fences are available, *Cydonia japonica* may be had in various shades of colour. Lilac 'Madame Lemoine' is one of the best varieties ; it is double white and lasts a long time in good condition. An old plant which often commences to flower in November—*Jasminum nudiflorum*—should be included ; it will grow as a bush, but is generally seen on a wall. *Wistaria sinensis* may be trained as a bush plant or over a pole, wall, porch, or any similar position ; it is usually a long time before it makes a good specimen.

ABSTRACT OF THE "MASTERS LECTURES," 1926.

THE UNLIMITED SCHEME AND FIXED POSITION OF THE PLANT-BODY.*

By Prof. F. O. BOWER, F.R.S.

[Read November 2, 1926; Sir JOHN FARMER, F.R.S., in the Chair.]

THE broad divergence between Plants and Animals in point of nutrition has carried with it a divergence equally broad in somatic structure and development. Comparison of certain simple forms of either kingdom points towards an origin from aquatic sources, possibly from a single generalized type. Whether or not this be actually so, the successive phases of certain Flagellates suggest those structural differences which have been worked out to full elaboration in the higher terms of the two kingdoms. The common *Euglena* supplies such phases: its naked motile stage may be held as prefiguring in a very general sense the mobile, dynamic animal: while the encysted non-motile stage of the same organism presents features characteristic of the cells that build up the practically static plant-body. Both kingdoms may be held to have started from the unicellular state, and to have progressed by cell-division to a multicellular soma. Such a progression is reflected with some degree of suggestiveness in the individual life of each. But in mechanical effectiveness they diverged: in the animal body certain protoplasts, unfettered by a protecting wall, developed contractility leading to muscular action upon bony spindles, with motility of the body as a whole or in part as the result. In plants the encysted cytoplasm developed along lines involving osmotic pressure upon the containing wall, which allows, it is true, motion within the cyst, but only very restricted movement of the cell or tissue as a whole. Thus while the animal body is constructed so as to obtain dynamic effects, the plant-body for the most part opposes only static resistance.

In relation to this divergence in point of motility there follows a broad embryological distinction. In all the higher animals the parts of the embryo are definite in number, and are initiated early. Their embryology is a passing phase, and the scheme of the animal body is then finally laid down. In the typical plant-body the parts are indefinite in number, and an unlimited succession of them may be initiated: the embryology is continued, and the scheme of the plant-body may be elaborated indefinitely without any theoretical term or limit. After centuries of existence the plant, perhaps even the same growing point, may still be producing new parts, such as leaves, branches, or roots. Together with this unlimited scheme goes also

* See also "Plants and Man," by Prof. F. O. Bower, 1925.

fixity of position, which naturally follows upon encystment, and upon the method of self-nutrition from inorganic sources by picking up food molecule by molecule. It is needless to elaborate the general thesis further, or to accentuate this antithesis between the evolution of the bodies of Plants and Animals.

The secret of plant-morphology lies buried in any winter bud, or in any root-tip. There by dissection anyone may find the growing point, composed of those embryonic cells which retain their youthful character: they grow and divide, not continuously perhaps, for they are liable to be checked in their activity by season, but without any final close or end. Theoretically the embryology of the plant is capable of indefinite extension in time and in space, and might result in the production of an infinite number of successive parts. The embryonic tissue thus endowed appears as a minute and delicate speck, of conical form, pale and semi-transparent, at the extreme tip of any stem or root. It is protected in the one case by the overlapping leaves, in the other by the root-cap. Its component cells are apparently all alike, thin-walled, densely protoplasmic, and each possesses a relatively large nucleus. Back from the extreme tip of the shoot the tissues progressively produced from it develop each for its specific function; while laterally from it a succession of leaves and axillary buds appear in regular order, the youngest being nearest to the tip. Since normally a fresh bud appears in the axil of each successive leaf, and each may develop to a new shoot like the first, the result is a branch-system increasing in a geometrical ratio.

Every vascular plant is constructed on some such unlimited scheme as this. But it will be asked, if the potentiality of indefinite development is there why are plants so limited in size, and relatively definite in shape and proportion? The reasons lie partly within, partly outside the plant itself. The scheme in practice is subject to various checks: there may be arrest of the apical growth due to internal causes, so that the growing point of the main stem or of any single branch may cease; many lateral buds lie dormant; season may arrest them temporarily; mechanical damage by winds or browsing animals or by parasitic fungi may all take their toll. But the most insistent and effective check of all is that imposed by the physiological drain of flowering and fruiting. This may impose a term upon the development of the main stem itself; but more frequently it checks the lateral branchlets, as it is seen to do in so many common shrubs and trees.

To look upon the herbs and woody plants of the garden or of the open country from the point of view thus briefly sketched adds greatly to the interest the plants themselves present. The herbaceous border, the rockery, or the wood all take on a new aspect when analysed in the terms of an unlimited scheme, checked and modified by internal and external influences, and the whole dominated by the fixity of position that follows. Even the humblest flowering plant of them all may be looked upon as the net product of the positive and negative

factors that balance to produce the plant as we see it. It is not always fully recognized that some of the most characteristic features of plant-life are really consequences that have necessarily followed upon that fixity of position which is so important a condition of their method of nutrition. For instance hermaphroditism, so uncommon in ambulatory animals, is a frequent feature of the static plant. Why should this be so? Provided the stamens and stigmas mature in succession, or that their form and position are suitable, hermaphroditism would encourage rather than oppose intercrossing by means of some external agent acting as carrier. The whole question of the transfer of pollen to the receptive surface, and the means outside itself that the plant adopts so that that end may be secured, may be traced back to the fixed position as the ultimate cause. Similarly the methods of seed-distribution, evolved along quite distinct though parallel lines, find their rational explanation in the disability which fixity imposes. It is as the seed that the progeny is normally distributed; it is then that the spread of habitat may be secured, or not at all. All the adaptations for pollination and for seed-distribution may be held as following from that immobility which has characterized vegetation in its higher forms.

Immobility started from the encystment of the protoplast, which thus secured safety and a means of developing mechanical strength, but at the sacrifice of mobility. In a sense the plant is like the armoured knight of mediæval times. But whereas his growing immobility as his armour increased in weight led to the extinction of his methods, the plant by infinite adaptability has been able to maintain itself throughout the ages in ever-growing variety of form, beauty, and efficiency. Vegetation has been hampered by its armour of cell-wall all through its descent, but has constantly modified the form and material of that armour so as to serve new and specialized uses.

THE EFFECT OF SIZE UPON THE CONFORMATION AND THE INTERNAL STRUCTURE OF THE PLANT-BODY.

[Read December 14, 1926; Mr. J. A. Voelcker, M.A. in the Chair.]

The recognition of that unlimited scheme upon which all the Higher Plants are constructed naturally introduces the question of Size, and of the problems, whether mechanical or physiological, which follow upon its increase. These problems are dominated by the Principle of Similar Structures, first enunciated by GALILEO. Applying it mechanically, it appears that while the strength of a structure varies as the square of the linear dimensions its weight varies as the cube. In other words, the larger the structure the greater will be the requirement of added strength to maintain its form. A similar relation affects the proportion of surface to bulk, which is of the greatest importance physiologically. We at once see then that what

may be possible mechanically or physiologically for a small body will become ever increasingly difficult, and finally impossible, for a big one. As in any bridge or building made by Man, so also the Plant must be of sufficient strength to maintain its form. Its power of resistance will need to be not only against gravity, but also against the impact of winds, or of streaming water, and various other external influences. Clearly then the larger the Plant the more strongly it must be built, and there will finally be for each a size-limit beyond which it would be impossible to go without some change of material, or of the method of its use in construction. The practicable limit which is possible for ordinary trees, constructed as they are, has been calculated. It lies at about 300 feet in length of the stem, or rather more. Beyond that limit the stem would bend or break. The whole mechanical problem in plants forms a fascinating subject of study, which was first developed in detail by Professor SCHWENDENER of Berlin. He showed that the mechanical principles adopted by human engineers in erecting buildings, bridges, and gasometers, or even in constructing his cordage or his clothes, find their parallels in the construction of plants. At the back of all lies the necessity, equally pressing for Man and for Plants, of deriving the greatest possible mechanical effect from the smallest possible expenditure of material. Moreover in both the greater the size the more insistent the problem becomes.

All plants start their normal development from the single cell. Except in the simplest of them that cell is encysted, and the protoplast strains the wall tight during active life with an osmotic pressure equal to that of several atmospheres. This pressure gives mechanical rigidity, as in a football or a pneumatic tyre. The larger the plant the more effective will be its nutrition as a whole: to secure large size the simplest method would seem at first sight to be to enlarge the single cell. But immediately the plant is up against the fact that while the volume or weight increases as the cube of the linear dimensions the strength or the surface only increases as the square. This simple means of increase is therefore bound soon to fail: and as a matter of fact such small measure of success as has been attained in this way has been limited to plants living in quiet water where mechanical risks are small. Most plants undergo cell-division, which brings advantages both mechanical and physiological; and the masses of tissue thus produced may grow, buoyed up by water as seaweeds are, to a large size without any great differentiation of the cells among themselves. Indeed the seaweeds, which suffer little disability from mechanical risks, include perhaps the largest of all living organisms. Certain brown tangles have been described as attaining a length of 800 feet.

Increase in size in sub-aerial plants, however, brings mechanical disabilities. The plant-body, consisting largely of water, has to support itself in the much lighter air, and to maintain its form though exposed to winds: it may temporarily yield to them, but must recover its

form very perfectly when the strain is removed. The first step in further advance is that special cells or strands of cells become thick-walled as mechanical tissues: they permeate the softer tissues as the metal wires or rods traverse and reinforce the concrete of modern buildings. Such structure is much more effective than any uniform mass of soft tissue. The larger the plant grows the greater the need for self-support mechanically. The familiar cambial activity provides against this in ordinary trees: and it may be continued in extreme cases until the limit of capacity to bear the weight of stem branches and leaves is approached: that weight increasing as the cube of the linear dimensions. The solid woody column thus produced in ordinary tree trunks may be from the engineering point of view a back number: but we are apt to forget that its function is not only mechanical, but that it also serves as a channel for conduction, and as a place of storage; all of these demands expand as the size increases. No engineer of bridges, towers, or gasometers has ever had to consider such diverse demands as are triumphantly met by any forest tree.

The problem for a stem which does not increase in thickness, but none the less grows according to the indefinite scheme, is a still more drastic one: it calls particularly for a most economical use of material so as to save weight. It is well illustrated by grass-haulms, from those of the smaller grasses to the gigantic Bamboo, rising well over 100 feet in height, and bearing aloft an immense crown of branches and leaves. In some grass-stems, such as Maize or Sugar Cane, the stem is solid, with numerous vascular strands of great tensile strength traversing the softer tissues. The construction is like that of reinforced concrete in modern building, and the principle is the same for both. But in Maize the outer zone of tissue is denser than that at the centre: in other grasses again this is accentuated, and the centre becomes a mere air-space, as in any hollow straw. A hollow tube is, however, liable to buckle and collapse: this is provided against by strong transverse plates, which prop out the wall of the cylinder. In grasses, and particularly in the giant Bamboo, these plates or septa are specially near together at the base where the greatest strain of leverage will be. Such devices as these have been made use of in the construction of spars for racing yachts.

A fruiting haulm of *Molinia* is about one-sixteenth of an inch in diameter at its base: it may be 30 inches long before bearing the inflorescence at its tip. Thus the proportion of length of stem to the diameter is as about 500 to 1. The stem of a giant Bamboo is constructed on the same general plan as that of *Molinia*: it may be as much as 35 metres high, and 30 cm. in diameter at the base: that is a proportion of only about 116 to 1. Both approach the limit of elastic resistance, as their graceful curves show. The comparison brings out the fact that a proportion which is possible for a haulm $2\frac{1}{2}$ feet high would be impossible for one of over 100 feet. Take another example where, however, the material and plan of construction are different, viz. the spire of Salisbury Cathedral. If built to

the same proportions as those of the *Molinia* stem, but of its own height, it would be less than one foot in diameter at its base. Such a proportion may suffice for a small grass, but it would be physically impossible for a spire of over 400 feet built of stone. The grass-haulm is one of the most wonderful mechanical structures in existence. Every field of wheat or barley waving in the breeze shows its near approach to the limit of effective existence: but every field that is "lodged," by combined wind and rain as harvest approaches, will illustrate disastrously how that limit may be overstepped.

In some Sedges the structure of the hollow stems may very nearly match that of a gasometer frame, where the girder-principle is introduced. But it is in the structure of the leaf-blade that this is most prominently seen. The leaf is normally the organ of nutrition under the influence of light: the larger the blade the more light will be captured, and the more extensive the nutrition. Thus a large leaf-surface is desirable. But there are various limiting factors, the most direct of which is mechanical risk. A large surface offers a large target for the wind. The leaf must be strong enough to resist, and to expose its surface uninjured, and in a convenient position. The leaf-stalk gives a more or less flexible joint, and the blade is often cut as a measure of safety into small leaflets, each with its own flexible base. But sooner or later we come to the flat expanse, where thin tissue is spread out on a framework of veins, forming a coherent unit. It is constructed so that the firm upper and lower epidermis bind together the soft mesophyll, while above and below each of the larger veins there commonly runs a strand of resistant tissue, forming a girder construction. These girders are held in place by the softer tissues in which they are embedded. This structure is less evident in the Dicotyledons, and comes out best in Monocotyledons with their parallel veins. The New Zealand Flax (*Phormium tenax*), which yields one of the best fibres of commerce, is an excellent example of girder-construction in a stiff sword-shaped leaf many feet in length. In a transverse section it is seen that on either side of each of the vascular strands is a thick band of the commercial fibrous tissue, constituting the upper and lower straps of so many parallel girders. The tissue between these is soft and mechanically negligible. The girders are here kept in place chiefly by the firm superficial tissues of the leaf. The whole forms a mechanical system not unlike that of a lattice-girder railway bridge. This may be held as an extreme case, but the method of construction is exhibited in varying degree of clearness in leaves at large.

Naturally the margins of a flat expanse exposed to rough winds will offer the risk of tearing from the margin inwards. In many leaves this is provided against by a band of hardened tissue that runs like the hem of a garment round the margins. An indentation, so common in leaves, would be a particularly vulnerable point. As in our clothes, this is often protected by a gusset of thickened tissue, which may even be found where there is no marginal 'hem.'

The mechanical requirement of a root is quite distinct from that of the stem or leaf. It has normally to resist longitudinal tension like a string, and like a string in which the fibrous strands are twisted together so as to occupy the least possible transverse area, so are the resistant vascular strands of roots concentrated in small area. A like condensation of the mechanically effective tissues is also seen in creeping stems, and in the stalks of pendent fruits. These all are called upon to resist longitudinal tension, and meet that requirement by a like structure, though they are parts of quite distinct nature from roots.

There is good reason for believing that the mechanical construction of the plant-body, such as has been above described, has come into existence in the course of Descent, and in accordance with the requirements: in fact, that it is the result of adaptation. As a rule the structure is hereditary, though experiment shows that the conditions to which the developing parts are exposed may influence the quantity of the hardened tissue formed, increasing or even stimulating its formation. But experiment will not explain the origin of the specific methods of its distribution. The degree of parallelism which those methods show to the methods of engineers in using their stone, steel, and concrete is remarkable. While we admire the efficiency of the result in either case, and especially the economy in the use of material made possible by those methods, it is to be remembered that the priority of initiative undoubtedly lies with the plant: for many of the methods represented in ancient fossil plants have only been adopted by Man in the last few decades. Nor is there evidence that engineers ever took, as well they might have done, any suggestion from the study of the engineering methods of plants. Similar results have been acquired independently along two quite distinct lines of evolution. In the one the results have followed from human calculation and experiment, in the other they are described as adaptive. But it is still an open question in what degree the mechanical structure seen in plants is related causally to the requirements which it so effectively meets.

VIOLAS FOR THE GARDEN.

By D. B. CRANE, F.R.H.S.

THE subject of my paper is one in which I have been very interested for many years. A few days ago, on referring to some old documents, I was surprised to find that, with others, I was interested in a trial of *Violas* in the gardens of the Royal Botanic Society, Regent's Park, in 1896; and two years later at a trial of *Violas* in the gardens of the Royal Horticultural Society, Chiswick, I was one of a body of experts appointed to adjudicate thereon. You will appreciate, therefore, that my association with the development of the *Viola* has been a fairly long one.

I have always regarded the *Viola* as ideal for cultivation in outdoor beds and borders, and in this connexion have always drawn a rigid line between varieties grown only to produce large flowers for exhibition and those specially suited for border cultivation. There has always been a disposition on the part of florists to give undue attention to the cultivation of *Violas* producing ideal flowers of abnormal size, and unfortunately this development has almost invariably been achieved at the expense of both the habit and the constitution of the plants producing them. There have been exhibited at the leading shows throughout the country, from time to time, displays of *Violas* calling forth the admiration of the visitors, who, charmed with the beauty and high quality of the flowers, have been led to purchase plants of those varieties, only to be disappointed with the display the plants make when grown outdoors in beds and borders.

Large, individual blossoms are not the only good points of a variety that the raiser should set out to achieve, as not infrequently beautiful flowers are produced on plants having a coarse, ungainly habit of growth that never develops into the useful tuft that one associates with the garden *Viola*. They also often lack the constitution which good border plants should always possess. The great desiderata in a *Viola* for ordinary garden embellishment are that it should be of a good tufted habit and have a constitution which will make it practically perennial in its character, and capable of resisting the vagaries of our trying British climate. Varieties for border cultivation should be essentially free-flowering, and should bear blossoms of distinct colours or markings on erect flower stalks, so that when the plants are grouped in small colonies or in large masses striking and beautiful effects are created in the garden.

I question whether there is any other subject in the whole of the floral world that yields so bountiful and continuous a display of blossoms as does the garden *Viola*.

The garden *Viola* should come into flower in the early spring, and, under proper treatment, should flower continuously throughout the summer and well into the autumn months ; any subject that produces results so highly satisfactory should, in my judgment, be regarded with the utmost favour.

It has been the object of those who are, or have been, closely identified with the development of the garden *Viola* to raise varieties that flower over a longer period than other varieties. I remember so well listening to a lecture given by Mr. WILLIAM CUTHBERTSON (now a distinguished member of the Council of the Royal Horticultural Society) in the 'nineties. He, at that time, was endeavouring to encourage London amateur gardeners to take up the cultivation of the *Viola*. I put to him the question as to the lines to be adopted in order to improve the *Viola* as we then knew it. In reply he suggested that it would be well to endeavour to produce varieties that would come into flower earlier in the season, or those that would flower later than usual. Very well, too, I remember doing my best to put his excellent advice into practice. In the course of a year or two I selected out of a batch of some thousands of seedlings a yellow variety which came into blossom three weeks or a month earlier than many other popular sorts then growing in my garden, and which, in consequence, appeared to have a value which other sorts did not possess. I named this seedling 'Mrs. E. A. Cade.' It was a beautiful sweet-scented, rayless variety, which has since had quite a successful and interesting life, as the records of some of the trials held under the auspices of the Royal Horticultural Society at Wisley go to prove. I made a present of half a dozen plants of it to a well-known specialist in the Midlands, and on paying him a visit quite early in the spring of the succeeding year he took me to his *Viola* grounds, saying he had something special to show me. There was only one variety then in flower ; it was making a very free and welcome display ; this variety proved to be the seedling which I had sent to him, and which I have just described. There is little doubt that this variety did something to fulfil what was in the mind of Mr. CUTHBERTSON at the lecture to which I have referred.

Only a few days ago, on asking a friend in the trade to mark a list of those varieties he considered to be the best for bedding purposes and garden embellishment, he marked 'Mrs. E. A. Cade' among a number of others.

I fear this aspect of the question has not received the attention it deserves, as the majority of the newer varieties begin to flower at much about the same time as the older varieties. It would be a distinct advantage were raisers to give more thought to producing varieties that will prolong the period of flowering. Anything done in this direction must, naturally, increase the value and usefulness of the subject, and this surely is worth striving after.

In the case of many of the varieties that have been introduced in recent years, the habit of growth still leaves much to be desired. For most positions in the garden, plants having a tufted habit of

growth have an advantage over those less tufted. *Violas* of tufted habit maintain the soil round about their roots in a cooler and moister condition than those that are not tufted, and in spells of hot, dry weather this is a great advantage. If it were possible to trace back the parentage of the plants of tufted habit, I think there is a great probability that the characteristic growth would be found to be due to crosses made earlier with some of the alpine species of *Viola*. Plants of this tufted habit are, as a rule, a mass of delicate rootlets just above, or immediately below, the surface soil. They appear to develop new shoots continuously, and so prolong the display of flowers, and moreover maintain the plants in a fresh and healthy condition. A garden *Viola* should, therefore, be compact or tufted in its growth, and be almost perennial in its character.

There are also garden *Violas* of procumbent growth, such as 'Ardwell Gem,' an old and useful variety, in colour a sulphur-yellow, and its two margined sports 'Goldfinch' and 'Duchess of Fife.' Plants of these types are never coarse and ungainly in their habit of growth, but creep along the ground within a fairly restricted area. The habit leaves nothing to be desired, and the blossoms are evolved quite freely on erect flower-stems. All through the summer they develop their embryonic shoots in abundance; these shoots push their way through the surface soil and, sooner or later, take their part in maintaining the display. I am still fond of these older sorts, and continue to regard them with much favour: in my opinion, they are infinitely better than many of the newer sorts.

The least satisfactory *Violas* are those which are to all intents and purposes tap-rooted, and in consequence are less able to resist the trying conditions of summer when it is hot and dry. They also have this disadvantage, that when attacked by wire-worms and the main root is punctured, the plants fail in their entirety.

For some time past there has been an increasing tendency on the part of some market growers to introduce varieties that develop very large flowers. It is quite reasonable to assume that plants developing large and attractive flowers are more readily saleable and realize better prices than those of smaller size, notwithstanding the fact that the latter produce their blossoms in prodigal profusion. Apparently, in the judgment of these growers, size is the one factor above all others that appears to influence the public. The result of pursuing this course is seen in the marketing of an immense number of plants in the spring and early summer each year, that I fear prove somewhat unsatisfactory as the season advances. The plants, when distributed, are presented in ideal condition and invariably carry one large and attractive flower, seen at its best. Varieties of this sort are the result of a very careful selection by market growers, from amongst the numbers of exhibition kinds that are catalogued by the *Viola* specialists. Market growers are always on the look out for exhibition *Violas* that possess a habit of growth stronger than the majority, and

when varieties selected for trial are found to answer their purpose they are grown in considerable quantities. In this way growers are gradually getting away from the excellent type of plant which was grown a few years ago with much success, and which gave so much satisfaction.

The name of JAMES GRIEVE will always be closely associated with the earlier development of the *Viola*. From him we learn that so long ago as 1862 he crossed *Viola lutea* with the ordinary Show Pansies then so popular. He also crossed *V. cornuta* (a Pyrenean species) with a Show Pansy of the name of 'Dux.' He further procured plants of *V. stricta*, and made numerous crosses with satisfactory results. There is little doubt, however, that to *V. lutea* and to *V. cornuta* we are to-day indebted for many of the more interesting and beautiful *Violas* in general cultivation. I have a distinct preference for the progeny resulting from crosses between *V. cornuta* and carefully selected garden *Violas*, using the former as the seed-bearing plant. Almost invariably the resultant seedlings produce plants having an ideal habit of growth: a large number of the flowers are quite good, and many of them of a high order of merit. The flowers, as a rule, are not large; as a matter of fact, they are generally on the small side. The smaller size of the blossoms is compensated for, however—if any compensation is necessary—by the floriferous character of the plants. They usually blossom in the greatest profusion, and the majority of the flowers are rayless. I wish to stress the importance of using plants of the wild species as the seed-bearing plant. The late Dr. CHARLES STUART, whose name will ever be associated with the *Viola*, writing to a mutual friend, said:

"In hybridizing or crossing wild varieties of *Violas*, it is necessary that the pollen should be taken from the cultivated species of Pansy and dusted over the pistil, that is, the wild species should be the mother. Pollen taken from *V. cornuta*, for instance, will, if put on the common garden Pansy, only give seed which will produce bedding Pansies, not the sturdy tufted-rooted dwarf strain."

The trials of *Violas* for the garden conducted by the Royal Horticultural Society, first at Chelsea and in later years at Wisley, have served to illustrate the beauty and usefulness of this subject. The trials of the plants are carried out having regard to dwarfness in growth, compactness of habit, profuseness and continuity of flowering, and the effectiveness and usefulness of their colours in the garden. The latest trial of *Violas* at Wisley was a distinct success. The plants were well grown and did exceptionally well. I understand that stocks of the better sorts were subsequently propagated in the autumn, and the resulting plants planted out in bold blocks in the succeeding spring. During the summer of 1925 they again did exceptionally well and were much admired. It was my good fortune to visit the Wisley Gardens on several occasions last year, and I always made a point of inspecting this continued trial of the garden *Viola*, which was an unqualified success. There was, perhaps, here and there,

a variety that was less satisfactory than the majority: generally, however, the plants were flowering in prodigal profusion, and the habit and character of the plants left little, or nothing, to be desired. With me were other growers who had given much attention to the garden Violas for many years; they were all much impressed with the splendid success of the experiment. Varieties that called for special mention were 'Snowflake' and 'Snow Queen' (white), 'Royal Sovereign' (golden-yellow), 'Primrose Dame' (primrose), 'Jubilee' (purple), 'Archie Grant' (violet-purple), 'J. B. Riding' (purplish-mauve), 'Swan' (white), 'Newton Mauve' (lavender-violet), 'Mrs. Chichester' (white, broadly edged violet and blue), 'Royal Scot' (bluish violet-purple), 'Perdita' (deep lavender-blue), 'John Quarton' (pale mauve-blue), 'Kingcup' (yellow), 'Lady Knox' (primrose), 'Bertha' (pale rosy-mauve), 'Councillor W. Watters' (rich purple-blue), 'Red Edina' (deep red-purple), 'Ardwell Gem' (sulphur-yellow), and 'Maggie Mott' (soft mauve). There were others, but the foregoing may be taken as a series of free-flowering, useful garden Violas.

I hope the Council of the Royal Horticultural Society will determine that the Floral Committee is to make no award to a new Viola intended for garden embellishment unless, and until, growing plants are first submitted for its adjudication. The garden-loving public would then be protected against purchasing useless sorts for the garden, and would know, in the event of an award being made, that the new sort was suitable for border cultivation. It is quite impossible to determine the habit of the plant when flowers only are shown.

In the case of Exhibition Violas it is quite different, as these plants are grown simply to produce high quality blooms, and exhibitors do not appear to pay much attention to habit of growth.

There are several different types of the garden Viola which may be briefly described as:

Self flowers, of which 'Snow Queen' (white) and 'Moseley Perfection' (yellow) are types.

Fancy flowers, of which 'Lizzie Storer' (purplish-violet and white) and 'Dr. McFarlane' (upper petals mauve, lower purple) are good examples.

Edged or Margined flowers, of which 'Duchess of Fife' (white flushed yellow centre, mauve-blue edging) and 'Gladys Finlay' (rayless white, with broad purple-blue margin) are types, and

Striped flowers, of which 'Mrs. Marrison' (mahogany, striped pink and rose) is a good type.

In earlier days, flowers of the Viola were almost invariably rayed, *i.e.* they had either faint or heavy lines radiating from the centre or eye of the flower, and in the judgment of many growers detracting from its beauty.

The rayless varieties are of later introduction, although, so far as my memory serves me and I am able to trace, they have been known for more than thirty years. It is in this section that the greatest advance has been made, both in habit of plant and in continuity of

flowering. The rayless *Violas* appear to be much more refined than the older rayed sorts, and they have been so vastly improved that we seem almost to have reached finality in regard to both size and colour. The flowers of some of the more recent introductions are of beautiful form, and are, moreover, of good substance; the latter a most important factor in hot, dry weather. A point often overlooked by growers is the fact that flowers of many of the varieties are beautifully sweet-scented, thus enhancing their value for indoor decorations.

Earlier in my remarks reference was made to the advantage of grouping the garden *Viola* in small colonies and in effective masses. In small gardens three to six plants arranged in a group, these groups repeated at intervals in the hardy flower border, seldom fail to provide attractive pieces of colour throughout the flowering period. In larger gardens plants may be advantageously grouped in masses of varying size to suit individual requirements, and in such positions they are always a centre of interest. As an edging to beds and borders they are always useful; but this method of planting can be overdone until it becomes almost monotonous. *Violas* can be usefully employed during the spring and early summer as a groundwork for beds of bulbous plants, such as *Narcissi*, *Hyacinths*, *Tulips*, etc. It is necessary, however, that care be observed in selecting varieties of a colour that contrast pleasingly with the other subjects, of which the *Violas* are the groundwork, such as a yellow *Viola* with a red *Tulip*, or a white variety with a dark red *Wallflower*. These are just instances of what could be done, and individual taste must, of course, always be respected. The same rule should be observed with regard to summer-flowering plants, when the association of *Violas* as a groundwork not seldom adds very materially to the beauty of the display.

One of the most beautiful and interesting groupings of *Violas* I have ever seen was that arranged by the late Mr. CHARLES JORDAN, when he was in charge of Regent's Park Gardens. He planned a raised flower-bed some 75 feet in length, of irregular outline, made to resemble a mound similar to many that he stated were frequently met with in alpine districts. In this irregularly shaped bed he grouped masses of eleven of some of the popular varieties of his day, arranging the colours so that there was nothing inharmonious in their grouping, and contrasting the *Violas* with such subjects as *Sedums*, *Saxifrage*s, and kindred plants. It was a beautiful idea and might, with advantage, be repeated in other gardens. I must confess to a weakness for setting aside one portion of the garden enclosure solely for garden *Violas*, where they are a source of pleasure for several months. Where this is not possible special beds might with advantage be made for the purpose. Grown in this manner they are of unfailing interest to the flower lover.

It was the custom in large gardens, not many years ago, to utilize the garden *Violas* for spring and early summer displays, and to lift the plants in the early summer to make room for the tender subjects which were then the vogue. In this way plants were lifted just when

they were at their best, to be superseded by others less hardy the existence of which was more or less precarious. I am glad this fashion has changed, and that it is realized that garden *Violas* are worthy of a permanent position in beds and borders.

I think I have said sufficient to indicate that the *Viola* is an excellent plant for the flower garden, and has few equals from the point of view of beauty and profusion of flower. I have also stressed the fact of its value for providing continuity of blossoms, its undoubted hardiness, and the splendid character of its constitution. It is a plant that readily adapts itself to town, suburban, and country gardens; although, of course, the results are less satisfactory in town gardens, where the atmospheric conditions are invariably somewhat impure and unsatisfactory. Notwithstanding this disadvantage, *Violas* seldom fail to justify their selection for the town flower garden. It is astonishing what splendid results are obtained in our London parks and open spaces. I often wonder what our Parks' Superintendents would do were they deprived of the use of the *Viola*, which has always proved so dependable.

To maintain the *Viola* in good health it is of the highest importance that the quarters in which the plants are to be flowered should be thoroughly well prepared; the best results are obtained when the beds and borders are deeply dug. I prefer to trench or bastard-trench that part of the garden allocated to these plants; the result of so doing is invariably seen at a later date, when the plants grow away freely and evolve blossoms in the greatest profusion over quite a long period. Many inexperienced growers are under the impression that the *Viola* is not a deep-rooting subject, and because of this fact they do not take the trouble to prepare the ground in as thorough a fashion as possible. I remember attending a *Viola* Conference at the Royal Botanic Gardens, Regent's Park, in 1896, on which occasion the late Mr. CHARLES JORDAN read a paper. He placed on the table a plant that had been lifted from the open border of Regent's Park, showing its roots running fully 3 feet through the soil from the base of the plant; and there were not merely one or two roots, but a whole mass of roots which had been working through the soil in search of food necessary to maintain the plant in a healthy condition.

This practical illustration of the vigorous growth of the roots left a lasting impression on my mind; and if I have desired good results, I have not failed to take full advantage of the lesson thus taught me of the importance not only of deep digging, but also of the necessity of applying plant food in liberal quantities, to which the plants never failed to respond. As I have said before, I question whether there is any subject in the whole of the floral world that flowers so continuously and for over so long a period as the *Viola*. On this account the roots must be continually drawing on the resources of the soil in order to maintain the plant. It will be realized, therefore, how important it is to prepare carefully the flowering quarters if the *Viola* is to be cultivated to the best advantage.

Violas will grow in almost any position, although they are not very happy where it is very shady and where they are subject to the continual drip from trees ; neither is it wise to plant them in a position where they are fully exposed to the sun in a warm aspect, such as in a south border ; in almost any other position they always do well. It may be possible in some gardens to give the Viola a position where it obtains the friendly shade of trees during the hottest hours of the day. Although I make these statements for the benefit of those less experienced, I am pleased to say I have grown the Viola quite successfully in almost every position, in beds quite open and exposed to the sun from the earliest hours of the morning until it sets in the evening. It will, therefore, be seen that the Viola is a most accommodating plant, and should meet the requirements of all those who desire to grow it.

The Viola is a plant well adapted to the requirements of the smallest cottage garden, and also never fails to justify its use in the larger garden of the mansion, provided the positions in which it is planted are properly prepared. In light sandy soils and those of a peaty nature it is well to apply a generous quantity of cow manure ; but in soils of a heavy texture with a clayey subsoil, with which I am only too familiar, well-rotted horse manure, burnt garden litter, and any material that will help to break up and lighten the soil, should be applied in abundance. A dressing of lime on heavy soils is also a distinct advantage, as it assists, in no mean degree, in the breaking up of the soil and setting free plant food, which the vigorous roots of the Viola are ready to assimilate.

Assuming the planting is to be done in the spring, it is a wise plan to dig over the beds and borders in the late autumn or early winter, so that the deeply dug soil may be exposed to the sweetening influences of the weather and pulverizing effect of frosts. Incidentally, insect pests are destroyed thereby. These remarks particularly apply to soils of a heavy nature, as not seldom soils of this sort are infested with wire-worm and leather-jacket grub, both of which especially infest old pasture land that has recently been turned over. It is my practice in such soils to place at the bottom of the trench a dressing of "Vaporite" or "Killogrub," or any similar preparation to kill off such pests. It is more or less useless to apply these insecticides after the ground has been deeply dug, as they can only be applied satisfactorily by placing the substance in the bottom of the trench, whence fumes are given off, permeating the soil and destroying the pests. It is hardly necessary to use these insecticides in the case of ordinary well-worked garden soils, as the chance of having to combat these pests is unlikely.

In the case of light soils already referred to, the effect of weather, frost, etc., on the soil hardly seems to be so beneficial. The great trouble, in such cases, is that the soil is so porous and hungry that it is difficult to provide sufficient plant food to maintain the plants in good form and condition. I know of gardens in which the soil is of a sandy,

peaty nature, where the plants are only maintained in satisfactory condition by frequent heavy dressings of cow manure. It is extraordinary how soon this heavy substance is lost. My friends tell me that these heavy applications of cow manure seem to disappear completely after a single season, imposing the necessity of applying further heavy dressings year after year ; but keen cultivators of the Viola do not consider the work too onerous if they can achieve their object.

To plant Violas in the same position a second season is generally recognized amongst growers to be a mistake—that is to say, if fresh young plants are to be planted in the same quarters in successive seasons. Successful cultivators endeavour to find fresh positions for their Violas each year. To change the positions of the beds and borders may not be an easy matter to arrange, but it is worth attempting. I know of gardens where this method has been observed with success. By so doing stocks have been maintained in a healthy state, and have provided a mass of blossoms in these same gardens for nearly thirty-five years. It has also been possible to change the soil of some of the beds and smaller borders in the gardens referred to, so that the same positions have been planted with Violas year after year. Not infrequently, when the Viola is planted for two or three years in the same position, the plants fail just when they are at their best ; for this reason a change either of soil or position is imperative if such a result is to be obviated. Where the plants are cut back after the first season, and it is desired particularly to retain them in the same position a second season, the soil round about them should be heavily mulched with some good lasting manure. This mulching will do much to maintain the plants in health, and largely ensure a continuous display of blossoms in wonderful masses. I have had plants of some of the better sorts flower in the same position for three years, but this is not general. Only in favourable quarters and in soil in good heart can this be done with any success. The better plan, undoubtedly, is to plant afresh each season in new quarters, or in fresh soil brought into the old quarters.

Propagation is quite a simple matter, and the merest novice should not fail to succeed. Just a few plants, under proper treatment, should yield an abundant supply of growths from which the cuttings are made. In gardens where the requirements are small, a sufficient supply of cuttings should be obtained without recourse to any special treatment of the plants from which the cuttings are procured. Where large supplies of cuttings are required, it is usual to cut back the flowering stems ; this will cause the plants to develop in a short time a mass of young growths of ideal character for propagation.

Propagation is usually done at two different periods, according to whether autumn or spring planting is proposed. Autumn planting is usually practised by those whose aim is to produce an early display in the succeeding spring, and the Violas are generally used for associating with Narcissi, Hyacinths, Tulips, Stocks, Irises, Wallflowers,

and other noteworthy spring-flowering plants. With this object in view it is usual to propagate from June onwards.

The cuttings may be inserted in frames, boxes, or under the friendly shade of dwarf bushes, such as bush fruit-trees. In these positions they will root quite readily, and provide ideal young plants for setting out in their flowering quarters in October or thereabouts. Another method of raising plants for autumn planting is to utilize plants that were lifted when the bulbs and other spring-flowering plants were removed from the beds and borders. These plants should be planted elsewhere and cut back; as a result, in a little while each plant will develop into a dense tuft which, lifted in early July and pulled to pieces, will provide a large number of young growths with rootlets. If these small pieces be planted in prepared beds in the open, where partial shade can be afforded during periods of hot sunshine, they will quickly develop into beautiful tufts for planting in their flowering quarters in the autumn. In gardens where spring planting is generally practised it is customary to propagate the plants during the autumn; cuttings should be inserted at any time they are obtainable between September and November. Although it has been my practice to insert cuttings of the *Viola* at any period round about September and October, I have always noticed that plants resulting from a November or even December propagation have proved the best plants in the spring. They may be just a trifle later, but they are invariably stouter and better looking than those propagated earlier, and grow away with vigour when planted in the spring. Cuttings inserted at this later period seldom fail. I have noticed row after row in the propagating frame without a single failure, their appearance as a whole in the early season being not unlike a watercress bed.

Ideal cuttings should be sturdy and short-jointed, and these are obtained from the base or crown of the old plants. They should be from $2\frac{1}{2}$ to 3 inches in length, not longer. On no account should coarse, hollow stem-cuttings be used. Cuttings are made ready for propagation by trimming off the lower leaves and stipulis that grow at each joint, and cutting through the stem at the base just below a joint. Short, basal shoots may often be severed with rootlets adhering, and growers without any convenience, such as a cold frame for propagating purposes, may find it more convenient to detach these basal shoots and insert them in prepared beds, to be lifted at a later date for planting in their flowering quarters. Success in providing a supply of plants for the subsequent season is by this means assured.

In cases where the cuttings are inserted in frames the latter should be of a shallow description and, of course, should be unheated. The cuttings should be put in about 2 inches apart, in rows 3 inches apart, using any fairly sandy compost. A good compost can be made up of two parts loam, one part leaf soil, with a free admixture of coarse sand or clean road grit. These soils should be passed through a sieve with a $\frac{1}{2}$ -inch mesh, and after being thoroughly mixed should be placed in the frame to a depth of 3 to 4 inches, and be made quite level and

firm. The insertion of cuttings in soil prepared in this manner is a very simple matter, and quite a large number of cuttings may be inserted in a comparatively short time. When inserting the cuttings it is most important that the soil be pressed firmly at the base of each cutting, and to this end the holes for their reception should not be deep, but just deep enough to insert the cutting to about half its depth and so that it rests on the soil in the bottom of the hole. In order to keep the stocks distinct and to avoid confusion, a label bearing the name of the variety should be first inserted, and the whole of the cuttings of the variety denoted thereon inserted immediately thereafter. Follow on in like manner with each successive variety ; then there will be no doubt as to the names of the varieties propagated.

It is the practice of many of those who grow large quantities of *Violas* to insert the cuttings in shallow boxes some 10 inches wide and 15 inches long by about 2 inches deep. A layer on the bottom of the box of siftings of the soil, and the boxes filled with the sifted compost already described, made quite firm, 80 to 100 cuttings should be accommodated quite comfortably. The cuttings should be watered in by the aid of a fine-rosed can. After being left to drain the boxes should be arranged evenly in the cold frame, where they should remain until the cuttings are rooted.

Each box of cuttings should be represented by nicely rooted specimens in February of the following year. At this time they should be transplanted 3 inches apart in prepared soil in cold frames. In the course of a month to six weeks they will develop into excellent plants of stocky character, and in March, or a little later, may be lifted with a mass of roots for transference to their flowering quarters. This may appear to be a rather more troublesome method than that usually observed by growers, but it well repays one for the trouble taken, and is infinitely better than lifting the young plants from the propagating frames where they were propagated in the previous autumn, whence they have never been removed. One of the most successful market growers observes this method of raising his plants, and in the spring and early summer he sends into Covent Garden Market tens of thousands of *Violas* that are unequalled for their sturdy character and promise for the future.

It is the practice in cases where plants are purchased from the *Viola* specialists, who frequently have to send them by post or rail from a considerable distance, to shake the roots free of soil, and to pack the plants in moss before dispatching them. In this way a small box is made to accommodate quite a large number of plants, and their condition on reaching the purchaser is not nearly so satisfactory as when the plants are available with balls of soil and roots adhering. Plants arriving from a distance should be unpacked without delay, stood in pots in a cool position, and watered overhead with water from a fine-rosed can. If allowed to remain in this position for a few hours, they will freshen up and be in a much better condition for planting outdoors. In view of the fact that the roots of these plants

have been denuded of soil, it is well to have in readiness at planting time a suitable quantity of carefully sifted soil of a light or sandy nature, to place around the roots when the planting is done. This is much more satisfactory than planting them straight into the ordinary soil of the garden, and does much to ensure the plants becoming quickly established.

In the early spring, when the weather is genial, it is absolutely necessary to give abundant ventilation to plants in the frames. It is a great mistake to coddle the plants; the *Viola* is a hardy plant, and should be treated in hardy fashion. If this is done there is little chance of the plants becoming infested with green-fly or red-spider, a common experience when the plants are coddled by the frame-lights being left on instead of abundant ventilation being afforded. It is my practice to remove the frame-lights as soon as possible in February. In the first instance, the frame-lights are raised a few inches, increasing the amount of ventilation from time to time until ultimately they are removed altogether. The frame-lights are replaced only when snow or exceptionally hard frosts are experienced. By the adoption of this course sturdy plants are developed, and these can be transferred to their flowering quarters quite early in March, without the slightest risk of bad results ensuing.

Should mildew appear on the plants, it may be readily checked if sprayed in good time with a solution of sulphide of potassium at the rate of $\frac{1}{2}$ oz. to a gallon of water. Slugs and snails are destructive to the foliage and flowers of the *Viola*; repeated dressings of soot or powdered lime applied late in the evening will do much to get rid of these pests. It may be necessary to repeat these dressings on alternate nights, two or three times, before they are destroyed. As already indicated, the addition of one of the vapour insecticides at the time of digging over the beds and borders will obviate much of the trouble from these pests.

In the meantime, of course, the beds and borders where the plants are to flower should be prepared for their reception. Before the *Violas* are planted the quarters should be lightly forked over and broken up to render the surface soil friable. Set out the plants from 6 to 9 inches apart. All too frequently they are too crowded in the beds and borders, consequently they cannot do themselves justice. My practice is to plant them 1 foot apart in rows, and to alternate the rows so that the plants are evenly distributed in groups either in the borders or the beds especially devoted to them. The choice of colours and their association is a matter of individual taste; each grower, therefore, should make his own selection of varieties to suit the particular purpose in view.

From the planting period right away until the autumn the plants should be carefully looked over at least once a week. Spent blossoms and seed pods should be pinched out, removing the flower stem at its base. Any unduly coarse growth that may have developed should be cut out so as to preserve the tuft-like appearance of the plants.

The dutch hoe should be used weekly in order to keep weeds under and to aerate the soil ; this is most important during spells of hot, dry weather. The well-being of the plants may be promoted by giving the beds and borders a liberal mulching, using well-rotted horse manure or any light compost for this purpose. First give the soil a hoeing over, then give the plants a copious watering, finishing off with a layer of mulching material, working this well into the collar of each plant : a stimulus is given to the plants and new growth quickly evolves. In hot weather a regular system of hoeing the flowering quarters is much better than watering ; the former keeps the plants in health, and the latter not seldom causes them to fail.

Now that so many varieties are catalogued by the specialists it is not easy to compile a list which will satisfy everybody. I do not, therefore, propose to attempt this, but to present a list of varieties that I feel will give satisfaction to those who may be in doubt which varieties to grow. I will just give the names of some of the better varieties of a section, which I will describe as bedding or garden *Violas*. This section is represented by *Violas* that produce in abundance flowers of moderate size, distinct in colour, and that possess a habit of growth specially adapted for garden culture as opposed to the purely exhibition sorts. The varieties are as follows :

White.—‘Swan,’ very neat habit. ‘Snowflake.’ ‘Snow Queen.’ These three varieties each received an Award of Merit at the last Wisley trial.

Light Yellow.—‘Primrose Dame,’ most persistent bloomer. ‘Margaret Wood,’ lemon-yellow, rayless. ‘Lady Knox,’ pale primrose, rayless.

Deeper Yellow.—‘Mrs. E. A. Cade,’ very early, flowers for a long period. ‘Redbraes Yellow,’ pale golden-yellow, compact and very tufted. ‘Royal Sovereign,’ bright golden-yellow, somewhat spreading.

Purple.—‘Jubilee,’ very effective deep red-purple. ‘J. B. Riding,’ purplish-mauve. ‘Archie Grant,’ deep violet-purple, with darker blotch on lower petal.

Mauve and Lavender.—‘Newton Mauve,’ lavender-violet, an ideal garden variety. ‘Maggie Mott,’ soft mauve. ‘Winchmore Bedder,’ deep violet-mauve, rayed a deeper shade.

Pale Blue.—‘W. H. Woodgate,’ the nearest approach to pale blue, cream round the eye, somewhat rayed with deep blue, liable to fail in hot weather.

Pink or Rose.—‘Bertha,’ pale rosy-mauve, very distinct. ‘Mary Burton,’ light rose-pink.

Margined.—‘Duchess of Fife,’ white, flushed yellow centre, edged mauve-blue. ‘Goldfinch,’ yellow, edged mauve-blue. Both with creeping-like habit. ‘Gladys Finlay.’ ‘Kathleen,’ white, margined red. ‘Peace,’ white, edged heliotrope. ‘A. S. Frater,’ white, edged blue. ‘James Pilling,’ white, edged lavender.

Fancies.—‘Dr. McFarlane,’ deep velvety blue-purple and lavender. ‘Lizzie Storer,’ velvety-blue purple and lavender.

Bronzes.—‘Mrs. Passfield,’ ‘Mrs. Marrison.’

A selection of the larger *Violas* of comparatively recent introduction may be interesting to those who desire to grow them. Plants of these varieties are of coarser growth and therefore not so compact as those mentioned in the previous selection. They do well, however, and the flowers are handsome and seldom fail to please. They are as follows :

‘Mrs. Andrew Stevenson,’ very large yellow, broadly edged bluish-lilac, rayless. ‘Mrs. Chichester,’ pale sulphury-white, flushed and broadly edged violet-blue, rayed deep blue. ‘Moseley Wonder,’ cream, flushed and broadly edged lilac-mauve, rayless. ‘Annie Hamilton,’ large, deep blue-purple, margined lavender—a fine fancy. ‘Mrs. J. Fisher,’ deep lilac-blue, shaded cream around eye. ‘Moseley Perfection,’ deep yellow. ‘Mrs. Jas. McEwan,’ creamy-white, rayless centre, deeply edged bluish-violet. ‘Wm. Barr,’ white self, very large. ‘Mrs. Jas. Smith,’ very large, upper petals lilac, lower cream shading to lilac at centre, rayed, and ‘Queen Mary,’ large rich rosy-purple.

SOME OBSERVATIONS ON THE HOT-WATER TREATMENT
OF NARCISSUS BULBS.

By GORDON W. GIBSON, F.L.S.

[The following paper was read at a Flower Growers' Conference at Penzance
on March 4, 1927.]

It would perhaps be useful to give first a brief outline of the material on which the observations which follow are based, so that you may know what value to put on the remarks. Most of you are aware that there are two Orders, known as the Bulb Diseases (Isles of Scilly) Orders of 1923 and 1924, which regulate the importation of Narcissus and Daffodil bulbs to the Isles of Scilly, and the treatment of diseased bulbs. Samples from all the bulbs brought to the Bulb Treating Station, St. Mary's, and put through the standard hot-water treatment of three hours' immersion in water retained at the temperature of 110°F ., have been grown in the Experiment Station grounds, and most of my remarks are based on these samples and other experimental lots. The entire quantity of bulbs treated in the Tresco and the St. Mary's hot-water plants in the last three seasons is about 300 tons.

I shall discuss the subject from the practical grower's point of view. The type of bulb-treating apparatus used is immaterial, so long as one can maintain the requirements of an even temperature of 110°F . Extreme variations of temperature should not be above 2 degrees, and then for only a short time.

I should like to stress one point here. The standard treatment is three hours' immersion at a temperature of 110°F .—which is not necessarily the same thing as three hours in the tanks. The temperature falls when the bulbs are put into the water, and as much as half an hour may elapse before an even temperature of 110°F . is obtained throughout the tank. Of course, to a large extent this depends on the apparatus in use. With bulbs of normal size, such as 'Emperor,' 'Soleil d'Or,' do not attempt to cut the time down, especially if you are treating in loose sacks—that is, if you want to kill all eelworm. Some growers are tempted to reduce flower injury by the very doubtful process of cutting down the duration of the immersion, and not infrequently blame the whole process because by such means complete control of the pest is not obtained.

The treated samples taken from bulk, and grown on at the Experiment Station, have given satisfaction so far as a complete kill of eelworm is concerned, and have remained clean for three years. Many of these samples were from extremely heavily infested stocks, and the general experience has been similar elsewhere. That is, that under completely controlled laboratory conditions the hot-water process will entirely free stocks of bulbs from eelworm.

Nowhere, however, is this desirable state of affairs obtained on a

field scale, and it seems that the difficulty lies in stopping all loopholes, to use a convenient term, by which eelworm may be carried from place to place. We have made a practice lately of utilizing reserve steam at the end of the day for sterilizing the sacks or baskets in which the bulbs are brought to the apparatus before they are returned to the farmer—we are extremely careful to sweep up all bulbs which fall to the floor before any batch of treated bulbs is taken from the tanks. There remain many loopholes, which it is very difficult to cope with. I mean, for example, the carts in which the bulbs are brought in.

I am sure it will pay growers to look closely to the application of the process, rather than the treatment itself.

In assessing the good derived, one ought to remember that the standard treatment kills all *Narcissus* fly larvæ, frees the bulbs from mite, and unquestionably invigorates the stock.

The most important point to the market grower of flowers is, How can the maximum amount of benefit be derived, with the minimum loss through damaged flowers?

I have never succeeded in treating some soft varieties, like 'Scilly White,' without damaging the flower bud to some extent. In general, however, it is quite possible to treat the bulbs for the standard time, and obtain perfect flowers in every way, providing the right time is chosen for the variety and year in question. That time is when the bulb has been thoroughly ripened and is dormant. Perhaps I ought to say most nearly dormant, for many varieties are never entirely resting. It is necessary to realize that the flower bud is developing within the bulb whether that bulb is in the ground or out of it. I could give you average bud measurements week by week in several varieties of stored bulbs, and in some cases the growth amounted to as much as 4 mm. (say $\frac{1}{8}$ in.) in a week. Such a bulb is obviously not dormant, and with many varieties (not all) serious malformation of the flower will result if the hot-water treatment is carried out then.

One example will serve my purpose. In a small laboratory plant 25 to 50 'Soleil d'Or' bulbs were treated each week from July 20 to September 28. The first batch put through, when the bud was rather below 1 mm. ($\frac{1}{8}$ in.) in size, was practically perfect in growth and flower. This was when the embryo flower bud was developing very slowly. During the period when the flower bud was growing rapidly within the bulb almost all the flowers on every stem were more or less distorted or inhibited in their growth. By the end of September, towards the close of the growing period of the flower bud in a stored bulb, the flower bud at this time being an inch long, you can again put the bulb through the process and obtain absolutely perfect flowers, as was the case with the last batch treated on September 28. Of course, these bulbs had been kept in a dry cool store and had not started to form roots.

As a guiding rule, then, ascertain as nearly as you can when growth is in abeyance, and carry out the hot-water treatment then.

Having carried out the treatment, cool the bulbs gradually and with minimum exposure to weather. An experiment with 'Ornatus,'



FIG. 52. --THE ' QUEEN ' PINEAPPLE.

HOOKE'S ILLUSTRATIONS
(p. 218).

[To face p. 216.



FIG. 53. -- THE 'WATERLOO' CHERRY.

HOOKE'S ILLUSTRATIONS
(p. 218).



FIG. 54. - THE 'BOURDIN' PEACH.
HOOKER'S ILLUSTRATIONS
(p. 218).



FIG. 53.—WYKEN PIPPIN.
HOOKER'S ILLUSTRATIONS
(p. 218).

[To face p. 217.

set out in detail in an article in the September issue of the *Journal of the Ministry of Agriculture*, showed that the damage to flower buds through suddenly chilling the bulb could be serious. From minimum to maximum exposure the percentage of flower buds destroyed to total flower buds rose from 0 to 42·6 per cent.

On the other hand, very slow cooling does not seem to cause any injury, even though the internal temperature of the bulb remains above 100° F. for as long as five hours after the three-hour immersion. So that although care is essential not to chill the bulb by too rapid evaporation from the surface of the wet and softened bulb, there is more than sufficient latitude in the other direction.

You have now some indication of how and when to treat Narcissus bulbs for eelworm, and the necessity of taking extreme care to avoid contamination with eelworm-infested material in carts, sacks, dust and debris, after treatment.

If so desired you may plant the bulbs whilst they are still wet. In fact, when the grower has his own plant, I suggest he may avoid considerable expense by doing so, when this is convenient. It is probable that the Dutch phytopathologist, Dr. VAN SLOGTEREN, is absolutely correct when he says that it is desirable to rest the bulbs after treatment; but there may be, and in fact are, objections in other directions. A batch of 'Soleil d'Or' bulbs was treated for three hours at 110° F. \pm , with a maximum of 112·1° F. The control, consisting of an equal number from the same lot of bulbs, was planted on July 28, with one lot of wet treated bulbs. Two days later another part of the same batch of treated bulbs was planted, these bulbs being dry superficially. A third lot of the treated bulbs, which had now been rested three weeks, was planted on August 18, and the remaining treated bulbs, after six weeks' rest, were planted on September 8. Slight distortion of the earlier flowers on each stem occurred with all the treated bulbs, but was uniform throughout, as might be expected and the batch planted wet and those rested three weeks compared favourably with the control. Those rested six weeks looked as though they were backward through late planting. The remaining lot which had been planted half-dried in July were no better than those rested six weeks and planted on September 8.

Let us briefly summarize:

1. The standard hot-water treatment should be three hours' immersion in water retained at a temperature of 110° F.
2. Treatment should be carried out when the bulb is as nearly dormant as possible. But considerable latitude in handling is possible where the bulbs are not of flowering size.
3. Cool the bulbs slowly without undue exposure.
4. Take every possible precaution to prevent the treated bulbs coming into contact either with soil or dust, sacks or debris, which might be infected with eelworm.
5. When convenient, treated bulbs may be planted wet without apparent injury; but the ideal is probably to dry and rest them for about three weeks before planting.

THE HOOKER AND LINDLEY DRAWINGS.

By E. A. BUNYARD, F.L.S.

THE history of our Society has not been one of unbroken prosperity. All who have followed its course from the first meeting in HATCHARD'S book-shop in Piccadilly on March 7, 1804, to the present day, will remember that for many years in the middle of the last century its finances moved steadily toward a crisis. In 1859 it was necessary to liquidate all available assets, and among these was the valuable library which had been so carefully accumulated.

Among the irreplaceable treasures was the long series of original drawings which had been made of new flowers and fruits, many of them of particular interest as a record of the first flowering of plants which the Society's collectors had introduced, such as the early types of *Chrysanthemum* from Japan and China. These drawings are now probably in private libraries, and in some cases at least are known to have crossed the Atlantic to find a permanent home in Botanical Institutions.

Perhaps the most valuable series were those of Fruits drawn by WILLIAM HOOKER, some of which were reproduced in the early Transactions of the Society and also in his "*Pomona Londinensis*," and the book of Rose species drawn by Dr. JOHN LINDLEY, who was so long associated with our Society, and others.

By a fortunate chance these drawings have come upon the market recently, and the Council have been able to secure them once more for the Library.

It has not been a policy of the Council in the past to purchase drawings, as it would be extremely difficult to assign a limit to such practice. The HOOKER drawings, however, stand alone in that they were definitely drawn for the Society, and it may also be said that they will form a standard which all present and future artists may profitably consult.

WILLIAM HOOKER was born in 1779 and studied his art under that great master of botanical drawing, FRANCIS BAUER. Little is known of his origin, but he was not related to the HOOKER family whose association with Kew Gardens is so well known. HOOKER was at once an artist and a gardener, and his knowledge of fruits especially was remarkable. RICHARD ANTHONY SALISBURY, himself no mean Pomologist, said in 1817, ". . . Mr. HOOKER, who I believe knows apples better than any of us."

HOOKER engraved and coloured the plates to KNIGHT'S "*Pomona Herefordensis*"; coloured the plates of LAMBERT'S "*Pinetum*," and himself produced his "*Pomona Londinensis*" and "*Paradisus Londinensis*," valuable works which were unfortunately not carried

to completion. Several articles by him will be found in the early Transactions of the Society. It is rare that artistic skill is combined with systematic knowledge of plants, and we can only remember POITEAU, who stands in this favoured position beside HOOKER. SALISBURY commemorated his name by giving it to *Hookera coronaria* (*Brodiaea grandiflora* Sm.), and among artists his name is remembered by a special pigment known as "Hooker's Green."

LINDLEY is so well known as a botanist and garden author that his skill as an artist is apt to be overlooked. The volume of Rose species, containing several of his drawings, however, shows that he was a skilled draughtsman, and it will be for this, and for sentimental reasons, a treasured possession of our Library.

Other artists who worked for the Society and who are represented in these volumes are C. J. ROBERTSON, MRS. A. J. WITHERS, BARBARA COTTON, and E. D. SMITH.

Name	Painted by	Date	Vol.	Plate	Trans. H. Soc.
APPLE :—					
Beauty of Kent . . .	W. Hooker . . .	1819 . . .	v . . .	1 . . .	
Bell's Scarlet . . .	B. Cotton . . .	1822 . . .	ix . . .	1 . . .	
Fearn's Pippin . . .	W. Hooker . . .	1816 . . .	ii . . .	2 . . .	
Golden Harvey . . .	C. J. Robertson . . .	1821 . . .	viii . . .	2 . . .	
Hughes' Golden Pippin . . .	W. Hooker . . .	1815 . . .	i . . .	1 . . .	
Kirke's Golden Pippin . . .	C. J. Robertson . . .	1820 . . .	viii . . .	12 . . .	
Kirke's Golden Reinette . . .	W. Hooker . . .	1816 . . .	ii . . .	4 . . .	
Lucombe's Seedling . . .	C. J. Robertson . . .	1821 . . .	viii . . .	4 . . .	
Padley's Pippin . . .	W. Hooker . . .	1818 . . .	iv . . .	6 . . .	
Robinson's Pippin . . .	W. Hooker . . .	1816 . . .	ii . . .	8 . . .	
Royal Pearmain . . .	C. J. Robertson . . .	1821 . . .	viii . . .	1 . . .	
Sack-and-Sugar . . .	C. J. Robertson . . .	1822 . . .	viii . . .	9 . . .	
The Alexander . . .	W. Hooker . . .	1818 . . .	iv . . .	1 . . .	{ Tr. H. Soc. ii. p. 407, not the same plate
„ Astrachan . . .	C. J. Robertson . . .	1821 . . .	viii . . .	11 . . .	
„ Blenheim Orange Pippin . . .	W. Hooker . . .	? 1821 . . .	vii . . .	1 . . .	
„ Borsdorff . . .	W. Hooker . . .	1819 . . .	v . . .	2 . . .	
„ Bur-Knott . . .	C. J. Robertson . . .	1822 . . .	viii . . .	6 . . .	
„ Carlisle Codlin . . .	W. Hooker . . .	1818 . . .	iv . . .	2 . . .	
„ Cockle Pippin . . .	W. Hooker . . .	1817 . . .	iii . . .	1 . . .	
„ Cornish July Flower . . .	W. Hooker . . .	1818 . . .	iv . . .	3 . . .	
„ Court of Wick . . .	W. Hooker . . .	1816 . . .	ii . . .	1 . . .	
„ Crofton . . .	W. Hooker . . .	1817 . . .	iii . . .	2 . . .	
„ Dutch Codlin . . .	W. Hooker . . .	1820 . . .	vi . . .	1 . . .	
„ Early July Flower . . .	No Name . . .	— . . .	vii . . .	2 . . .	
„ Early Russian . . .	W. Hooker . . .	1819 . . .	v . . .	6 . . .	
„ Embroidered Pippin . . .	C. J. Robertson . . .	1822 . . .	viii . . .	7 . . .	
„ Gravenstein . . .	W. Hooker . . .	1819 . . .	v . . .	3 . . .	{ Tr. H. Soc. iv. p. 523 appears to be a differ- ent apple
„ Hawthornden . . .	W. Hooker . . .	1816 . . .	ii . . .	3 . . .	
„ Kerry Pippin . . .	W. Hooker . . .	1818 . . .	iv . . .	4 . . .	
„ Keswick Codlin . . .	W. Hooker . . .	1819 . . .	v . . .	4 . . .	
„ King of the Pippins . . .	W. Hooker . . .	1817 . . .	iii . . .	3 . . .	
„ Lemon Pippin . . .	C. J. Robertson . . .	1822 . . .	viii . . .	8 . . .	
„ Margil . . .	W. Hooker . . .	1816 . . .	ii . . .	5 . . .	
„ Nonesuch . . .	W. Hooker . . .	1818 . . .	iv . . .	5 . . .	
„ Nonpareille . . .	W. Hooker . . .	1817 . . .	iii . . .	4 . . .	
„ Norfolk Beaufin . . .	C. J. Robertson . . .	1822 . . .	vii . . .	10 . . .	
„ Ord . . .	W. Hooker . . .	1815 . . .	i . . .	2 . . .	{ Tr. H. Soc. ii. p. 285

Name	Painted by	Date	Vol.	Plate	Trans. H. Soc.
APPLE (<i>cont.</i>):—					
The Oslin	W. Hooker . .	1819	v	5	
„ Red Ingestrie . .	C. J. Robertson .	1822	viii	5	
„ Red Quarenden . .	W. Hooker . .	1817	iii	5	
„ Ribston Pippin . .	W. Hooker . .	1816	ii	7	
„ Scarlet Nonpareille .	W. Hooker . .	1816	ii	6	
„ Siberian Harvey . .	W. Hooker . .	1818	iv	7	
„ Spring Grove Codlin .	W. Hooker . .	1820	vi	2	
„ Syke-house	W. Hooker . .	1816	ii	9	
„ Trumpington	W. Hooker . .	1819	v	7	
„ Turk's Cap	No name	n.d.	vii	3	
„ Violet	W. Hooker . .	1818	vii	4	
„ Wax	W. Hooker . .	1820	vi	3	
„ Wellington	B. Cotton . . .	1822	ix	3	
„ Wormsley Pippin . .	W. Hooker . .	1820	vi	4	
White Easter	C. J. Robertson .	1821	viii	3	
Wyken Pippin	C. J. Robertson .	1821	viii	13	
No name	Mrs. Withers . .	n.d.	ix	16	
APRICOT :—					
Musch Musch	Mrs. Withers . .	n.d.	ix	27	{ Tr. H. Soc. S. II. i. p. 72
The Algiers	W. Hooker . .	1819	v	8	
„ Breda	W. Hooker . .	1819	v	9	
„ Brussels	W. Hooker . .	1821	vi	5	
„ Moor Park	W. Hooker . .	1815	i	3	
„ Orange	W. Hooker . .	1818	iv	8	
CHERRY :—					
Black	Mrs. Withers . .	1825	ix	25	
Flemish	No name	n.d.	vii	12	
Knight's Early Black .	W. Hooker . .	1818	iv	9	
„ Late Black	No name	n.d.	vii	5	
The Bigarreau	W. Hooker . .	1817	iii	6	
„ Black Eagle	W. Hooker . .	1815	i	4	{ Tr. H. Soc. ii. p. 138
„ Black Tartarian . .	W. Hooker . .	1815	i	5	
„ Carnation	No name	n.d.	vi	6	
„ Elton	W. Hooker . .	1817	iii	7	
„ Florence	W. Hooker . .	1816	ii	10	{ Tr. H. Soc. ii. p. 229
„ May Duke	W. Hooker . .	1815	i	6	
„ Morello	W. Hooker . .	1818	iv	10	
„ Tradescant	W. Hooker . .	1818	iv	11	
„ Waterloo	W. Hooker . .	1816	ii	11	{ Tr. H. Soc. ii. p. 302
White Tartarian . . .	C. J. Robertson .	1821	viii	14	
No name	Mrs. Withers . .	1825	ix	22	
CHESTNUT :—					
The Spring Grove . .	No name	n.d.	vii	6	
CRAB :—					
Knight's Yellow . . .	W. Hooker . .	1816	ii	12	
Red August Siberian .	C. J. Robertson .	1821	viii	16	
The Minshul	Barbara Cotton .	1822	ix	2	
„ Tartarian	W. Hooker . .	1820	vi	7	
CURRANT :—					
Morgan's Seedling White	C. J. Robertson .	1820	viii	15	
The White Dutch . . .	W. Hooker . .	1816	ii	13	
DAMSON :—					
The Shropshire . . .	W. Hooker . .	1818	iv	24	
White	C. J. Robertson .	1820	viii	21	
FIG :—					
The Large Blue . . .	W. Hooker . .	1817	iii	8	
„ White	W. Hooker . .	1817	iii	9	
GOOSEBERRY :—					
Compton's Shela's Queen	Mrs. Withers . .	1825	ix	15	
Reynolds' Golden Drop	W. Hooker . .	1815	i	7	



FIG. 50. TRUE CHILI STRAWBERRY.
HOOKER'S ILLUSTRATIONS
(p. 218).

[*Face p. 220.*



FIG. 57.—THE 'MOOR PARK' APRICOT.
HOOKER'S ILLUSTRATIONS
(p. 218).



FIG. 58. — *CORNUS CAPITATA*.

HOOKE'S ILLUSTRATIONS
(p. 218).



FIG. 50. *ROSA SPINOSISSIMA* var. *PALLIDA*.

HOOKE'S ILLUSTRATIONS
(p. 218).

[To face p. 221.

Name	Painted by	Date	Vol.	Plate	Trans. H. Soc.
GOOSEBERRY (cont.) :—					
The Champagne . . .	C. J. Robertson .	1820	viii	17	
„ Red Warrington . .	W. Hooker .	1818	iv	12	
Wilmot's Early Red . .	W. Hooker .	1815	i	8	
GRAPE :—					
Cannon Hall Muscat . .	Mrs. Withers .	n.d.	ix	24	{ Trans. S. II. i. p. 169
Chassilas Muscat . . .	Mrs. Withers .	n.d.	ix	20	
Le Raisin des Carmes . .	W. Hooker .	1815	i	11	
The Black Corinth . . .	W. Hooker .	1820	vi	8	{ Trans. S. II. i. p. 246
„ Black Frontiniae . .	W. Hooker .	1818	iv	13	
„ Black Hamburgh . .	W. Hooker .	1818	iii	13	
„ Black Prince . . .	W. Hooker .	1815	i	9	
„ Blue Muscadine . . .	W. Hooker .	1817	iii	15	
„ Claret . . .	W. Hooker .	1815	i	10	
„ Damson . . .	W. Hooker .	1817	iii	10	
„ Esperione . . .	W. Hooker .	1817	iii	11	Trans. iii. p. 93
„ Grisley Frontiniae . .	W. Hooker .	1817	iii	12	
„ Pitmaston White Cluster . . .	W. Hooker .	1818	iv	15	Trans. iii. p. 249
„ Kishmush . . .	W. Hooker .	1819	v	10	
„ Poonah . . .	W. Hooker .	1820	vi	9	Trans. iv. p. 212
„ Red Hamburgh . . .	W. Hooker .	1817	iii	14	
„ Verdelho . . .	W. Hooker .	1816	ii	14	Trans. ii. p. 106
„ White Muscat of Alexandria . . .	W. Hooker .	1818	iv	14	
Tottenham Park Muscat	C. J. Robertson .	1825	ix	12	
White Calabrian Raisin	No name .	n.d.	vii	15	
LEECHES :—					
[<i>Cornus capitata</i>]	No name .	n.d.	vii	14	
MANGO :—					
The Red Powis and The Yellow Powis	Mrs. Withers .	1826	ix	18	Trans. vi. p. 550
MEDLAR :—					
The Dutch . . .	W. Hooker .	1816	ii	15	
„ Nottingham . . .	W. Hooker .	1816	ii	16	
MELON :—					
Green-fleshed Egyptian	No name .	n.d.	vi	10	
The Black Rock . . .	W. Hooker .	1815	i	12	
„ Persian Damsha . .	No name .	n.d.	vi	11	
(first fruit)					
„ Persian Damsha . .	No name .	n.d.	vi	12	
(second fruit)					
„ Romana . . .	W. Hooker .	1818	iv	16	
MULBERRY :—					
The Black . . .	W. Hooker .	1816	ii	17	
NECTARINE :—					
Aiton's Seedling . . .	W. Hooker .	1819	v	11	
Fairchild's Early . . .	W. Hooker .	1818	iv	17	
The Cowdray White . .	W. Hooker .	1820	vi	13	
„ Elrue . . .	W. Hooker .	1817	iii	16	
„ Old Newington . .	No name .	n.d.	v	12	
„ Pitmaston Orange . .	W. Hooker .	1820	vi	14	Trans. iv. p. 232
„ Red Roman . . .	W. Hooker .	1819	v	13	
„ Vermash . . .	W. Hooker .	1815	i	13	
„ Violette Hâtive . . .	W. Hooker .	1817	iii	17	
„ White . . .	W. Hooker .	1818	iv	18	
NUT :—					
Lambert's Large . . .	No name .	n.d.	vi	15	
The Cob . . .	W. Hooker .	1816	ii	18	

<i>Name</i>	<i>Painted by</i>	<i>Date</i>	<i>Vol.</i>	<i>Plate</i>	<i>Trans. H. Soc.</i>
PEACH :—					
Braddick's American .	W. Hooker .	1815	4	15	Trans. ii. p. 205
Catherine .	C. J. Robertson .	1820	viii	18	
Grimwood's Royal George	W. Hooker .	1816	ii	19	
Spring Grove .	No name .	n.d.	vi	16	
The Acton Scott .	W. Hooker .	1815	i	14	Trans. ii. p. 142
„ Bourdine .	No name .	n.d.	v	14	
„ Double Swalsh .	B. Cotton .	1822	ix	5	
„ Galande .	no name .	n.d.	v	15	
„ Late Admirable .	B. Cotton .	1822	ix	4	
„ Old Newington .	B. Cotton .	1822	ix	6	
„ Pitmaston Sanguinole	No name .	n.d.	vii	7	
„ Red Magdalene .	W. Hooker .	1819	v	16	
Titon de Virnes .	B. Cotton .	1822	ix	7	
Vanguard .	B. Cotton .	1822	ix	8	

PEAR :—					
Beurrée Aremberg .	Mrs. Withers .	1826	ix	9	Trans. vii. p. 178
Duchesse d'Angoulême .	Mrs. Withers .	1826	ix	9	Trans. vii. p. 176
Gansel's Bergamotte .	W. Hooker .	1816	ii	21	
Gloux Morceaux .	Mrs. Withers .	1826	ix	9	Trans. vii. p. 178
Marie Louise .	C. J. Robertson .	1820	viii	19	Trans. iv. p. 519
Napoleon .	C. J. Robertson .	1820	viii	20	
The Aston Town .	W. Hooker .	1818	iv	19	
„ Boyle Farm Wilding	W. Hooker .	1820	vi	17	
„ Brown Beurrée .	W. Hooker .	1815	i	16	
„ Chaumontelle .	W. Hooker .	1818	iv	20	
„ Colmar .	W. Hooker .	1817	iii	18	
„ Crasanne .	W. Hooker .	1815	i	17	
„ D'Auch .	W. Hooker .	1817	iii	19	
„ Elton .	No name .	n.d.	vi	18	Trans. ii. p. 1. Not this plate
„ Jargonelle .	W. Hooker .	1818	iv	21	
„ Little Crasanne .	W. Hooker .	1816	ii	20	
„ Little Muscat .	No name .	n.d.	vi	19	
„ Scarlet Beurrée .	W. Hooker .	1819	v	17	
„ Seckle .	W. Hooker .	1821	vii	8	Trans. ii. p. 258. Not this plate
„ Summer Bon Chrétien	No name .	n.d.	vi	20	
„ True St. Germain .	W. Hooker .	1817	iii	20	
„ White Beurrée .	W. Hooker .	1815	i	18	
Williams' Bon Chrétien .	W. Hooker .	1816	ii	22	Trans. ii. p. 250
No name .	No name .	n.d.	vii	13	
No name .	No name .	n.d.	ix	13	

PINE :—					
The Black Jamaica .	W. Hooker .	1815	i	19	
„ Enville .	W. Hooker .	1817	iii	21	
„ Green Antigua .	No name .	n.d.	vi	21	
„ Queen .	W. Hooker .	1817	iii	22	
„ Welbeck Seedling .	W. Hooker .	1819	v	18	

PLUM :—					
Black Damascene .	C. J. Robertson .	1820	viii	24	
Coe's Golden Drop .	W. Hooker .	1818	iv	23	
Great Quetch .	C. J. Robertson .	1820	viii	23	
Mr. Knight's Seedling					
Plums .	Mrs. Withers .	1826	ix	17	Trans. vi. p. 530
Pigeon's Heart .	C. J. Robertson .	1820	viii	22	
Précoce de Tours .	W. Hooker .	1815	i	22	
The Catherine .	W. Hooker .	1815	i	20	
„ Gisborne .	W. Hooker .	1819	v	19	
„ Green Gage .	W. Hooker .	1815	i	21	
„ Impératrice .	W. Hooker .	1816	ii	23	
„ Mimms .	W. Hooker .	1820	vi	22	
„ Morocco .	W. Hooker .	1819	v	21	
„ Nectarine .	W. Hooker .	1817	iii	23	
„ Royale .	W. Hooker .	1815	i	23	
„ Vienna .	No name .	n.d.	vii	9	

Name	Painted by	Date	Vol.	Plate	Trans. H. Soc.
PLUM (cont.) :—					
Washington . . .	C. J. Robertson .	1824	vii	11	
White Impératrice .	C. J. Robertson .	1821	viii	25	
Wilmot's Green Gage .	No name .	n.d.	v	20	
Wilmot's Early Violet .	W. Hooker .	1819	v	23	
Wilmot's New Orleans .	W. Hooker .	1819	v	22	Trans.iii. p. 392
No name . . .	No name .	n.d.	vii	16	
QUINCE :—					
The Pear-shaped . .	W. Hooker .	1816	ii	24	
RASPBERRY :—					
The Red Antwerp . .	W. Hooker .	1818	iv	25	
The Yellow Antwerp .	W. Hooker .	1815	i	24	
SERVICE :—					
The Pear-shaped . .	W. Hooker .	1820	vi	23	
STRAWBERRY :—					
Knight's Scarlet Fleshed	Mrs. Withers .	1825	ix	21	
Prolific Hautbois . .	No name .	n.d.	ix	11	
Sweet Cone . . .	No name .	n.d.	ix	10	
The Bath Scarlet . .	W. Hooker .	1817	iii	24	
„ Chili . . .	W. Hooker .	1819	v	24	
„ Downton . . .	W. Hooker .	1819	v	25	Trans. iii. p. 396
„ Pine . . .	W. Hooker .	1815	i	25	
„ Roseberry . . .	W. Hooker .	1817	iii	25	Trans. ii. p. 378
True Chili . . .	No name .	n.d.	ix	19	
Wilmot's Superb . .	C. J. Robertson .	1824	ix	14	Trans.vi. p. 392
Wilmot's Cocks-comb					
Scarlet . . .	W. Hooker .	1820	vi	24	
No name . . .	No name .	n.d.	ix	23	
WALNUT :—					
The High-flyer . . .	W. Hooker .	1820	vi	25	
„ Large French . .	W. Hooker .	1816	ii	25	

FLOWERS.

Achimenes :—					
picta . . .	No name .	n.d.	vii	21	Trans. S. II. iii. p. 161
longiflora . . .	No name .	n.d.	vii	22	Trans. S. II. ii. p. 508
Camellias :—					
	Mrs. Withers .	1827	vii	17	Trans. vii. p. 545
Cattleya :—					
guttata . . .	No name [Miss Drake]	n.d.	vii	18	Trans. S. II. ii. p. 177
Chorizema :—					
varium . . .	No name .	n.d.	vii	20	Trans. S. II. ii. p. 478
Chianthus :—					
punicus . . .	No name .	n.d.	vii	25	Trans. S. II. i. p. 519
Cyclobothra :—					
alba . . .	No name .	n.d.	x	17	Trans. S. II. i. p. 409
pulchella . . .	No name .	n.d.	x	19	Trans. S. II. i. p. 409
Gilia :—					
tricolor . . .	No name .	n.d.	vii	24	Trans. S. II. i. p. 477
Leptosiphon :—					
androsaceus . . .	No name .	n.d.	vii	24	Trans. S. II. i. p. 477
densiflorus . . .	No name .	n.d.	vii	24	Trans. S. II. i. p. 477

	Name	Painted by	Date	Vol.	Plate	Trans. H. Soc.
<i>Lupinus</i> :—						
	nanus . . .	No name	. n.d.	x	20	{ Trans. S. II. i. p. 409
<i>Oncidium</i> :—						
	Lanceanum . . .	No name	. n.d.	vii	19	{ Trans. S. II. ii. p. 100
<i>Ribes</i> :—						
	sanguineum . . .	Mrs. Withers	. 1829	ix	26	Trans. vii. p. 509
<i>Rosa</i> :—						
	acicularis v. viridis . . .	J. Lindley	. 1821	x	3	
	arvensis . . .	E. D. Smith	. n.d.	x	11	
	arvensis v. Andersonii . . .	J. Lindley	. 1820	x	2	
	Doniana v. scotica . . .	J. Lindley	. 1821	x	12	
	Doniana v. Warwickshire . . .	E. D. Smith	. n.d.	x	9	
	frutetorum . . .	E. D. Smith	. n.d.	x	15	
	Herbert's Evergreen China . . .	E. D. Smith	. n.d.	x	14	
	involuta . . .	E. D. Smith	. n.d.	x	8	
	New ferox . . .	E. D. Smith	. n.d.	x	7	
	pruinosa . . .	E. D. Smith	. n.d.	x	6	
	rubella marmorea . . .	E. D. Smith	. n.d.	x	16	
	rubrifolia . . .	E. D. Smith	. n.d.	x	10	
	Sabini . . .	J. Lindley	. 1821	x	13	
	spinosissima v. pallida . . .	J. Lindley	. 1821	x	5	
	systyla v. Monsoniae . . .	J. Lindley	. 1820	x	1	
	Woodsii . . .	J. Lindley	. 1821	x	4	
<i>Salvia</i> :—						
	patens . . .	No name [Miss Drake]	. n.d.	vii	23	Tr. S. II. i. p. 222
<i>Triteleia</i> :—						
	laxa . . .	No name	. n.d.	x	18	Tr. S. II. i. p. 411

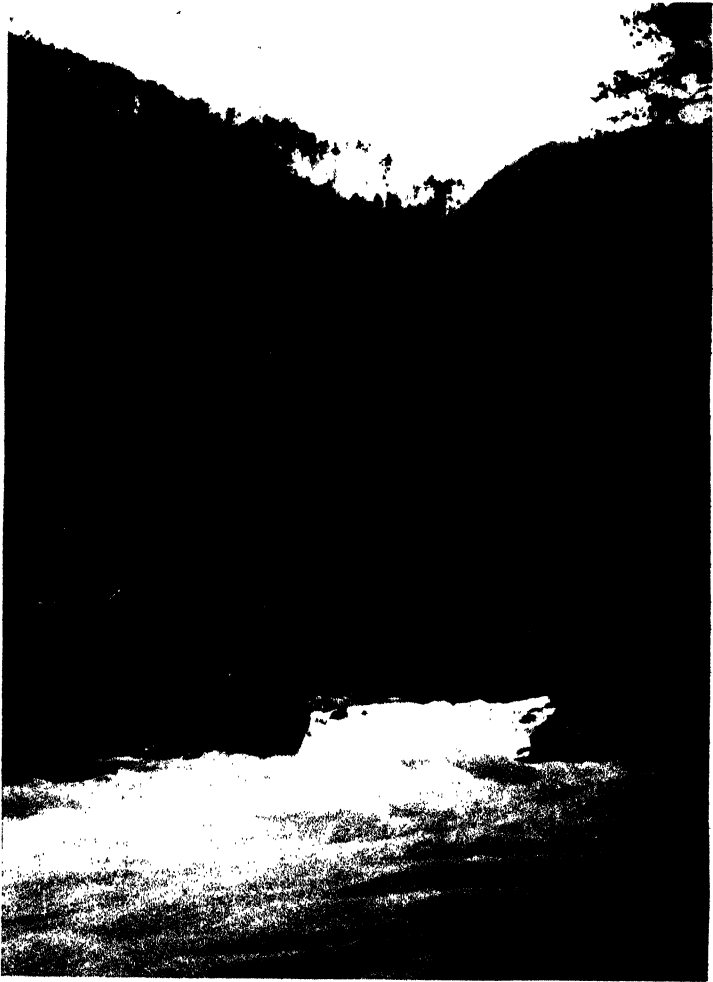


FIG. 60.—PINE AND PICEA FOREST, TIBET.

[To face p. 224-

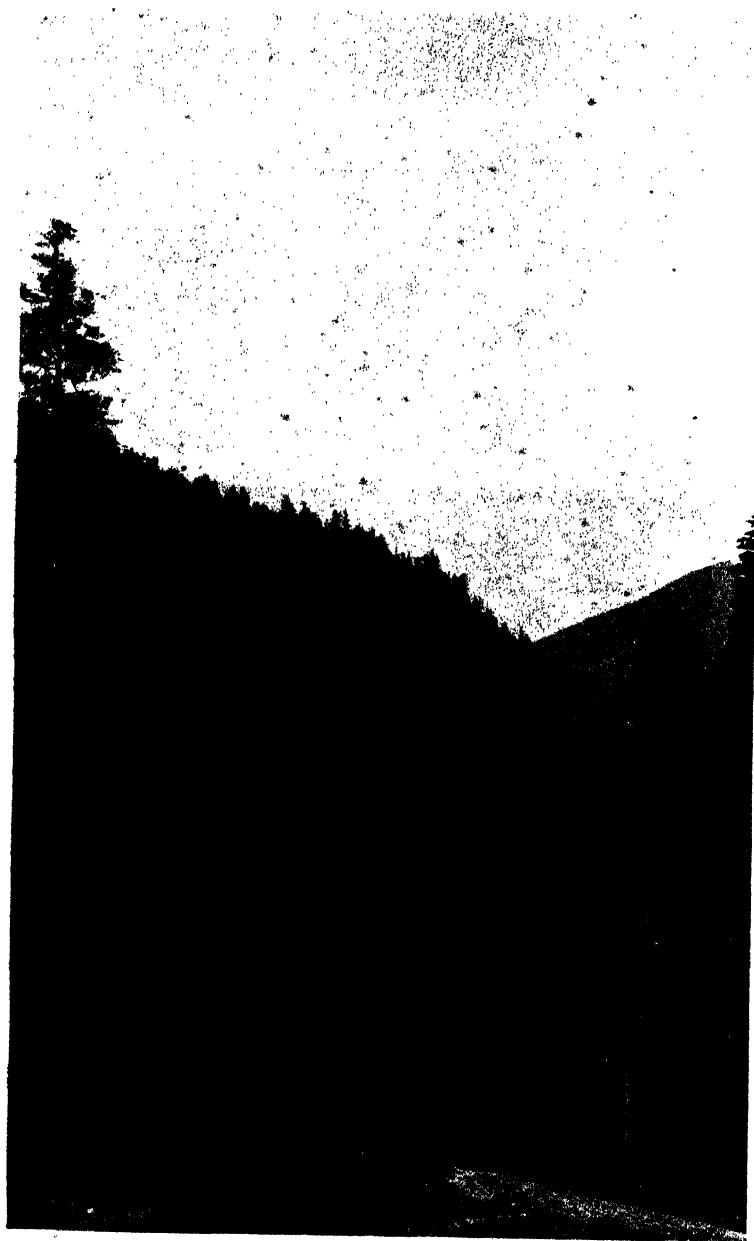


FIG. 61.—PICEA-RHODODENDRON FOREST IN TIBET.



FIG. 62.—*ABIES* AND RHODODENDRON SCRUB (*R. TRICHOCLADUM*, AND SOULIEI AND THOMSONI SERIES) WITH ALPINE RHODODENDRONS ABOVE.



FIG 63.—RHODODENDRON SP. (*R. TALIENSE*). IN DRY REGION OF
MIXED FOREST, TIBET.



FIG. 64.- REODODENDRON SP. (LAPPONICUM). DRY REGION, TIBET.

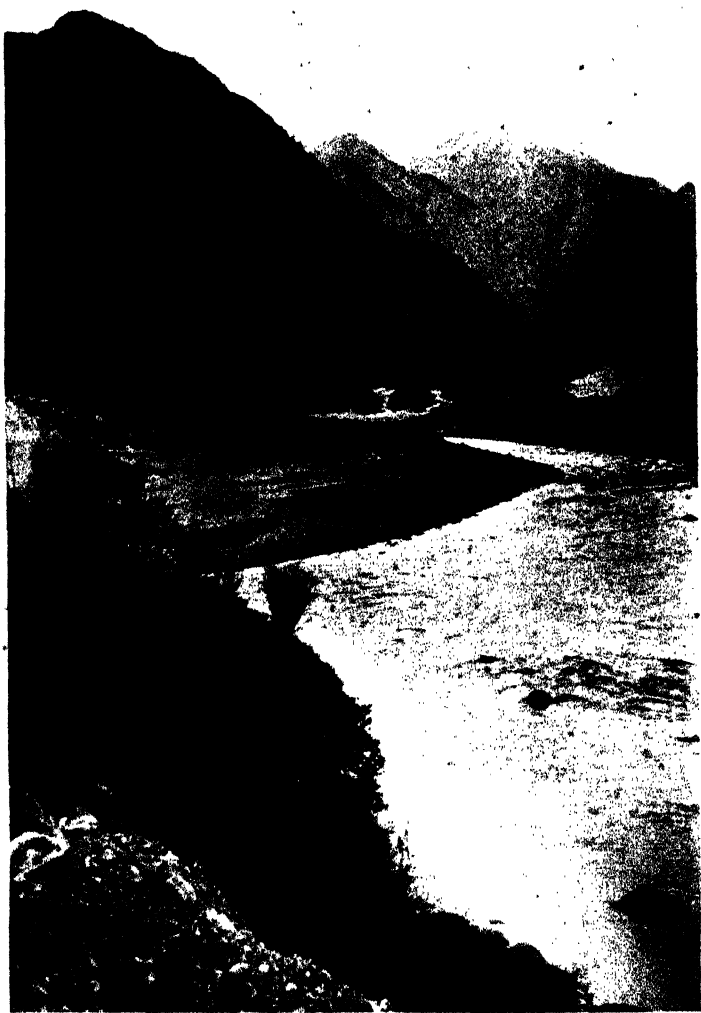


FIG. 65.--SCRUB BELOW CONIFER FOREST, TIBET. REGION OF DRY WINTERS
AND WET SUMMERS.

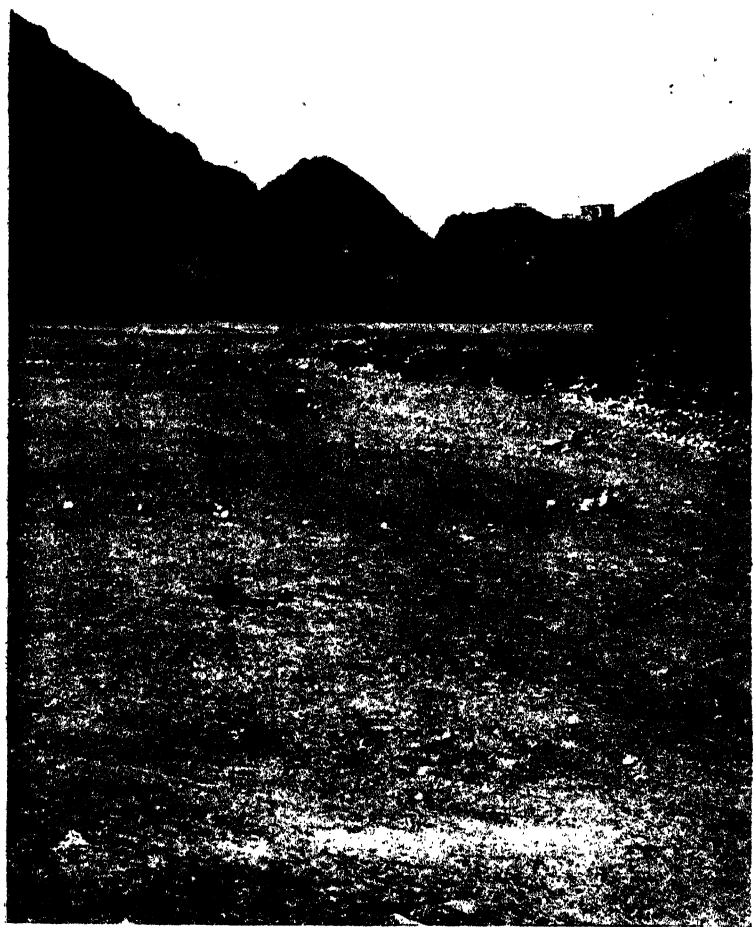


FIG. 66.—TIBETAN PLATEAU SCENERY. NO FOREST AND ONLY SCATTERED SHRUBS.



FIG. 67.—*LILIUM THOMPSONIANUM*.

[To face p. 225.]

BOTANICAL EXPLORATIONS IN TIBET.—II.

By Capt. F. KINGDON WARD.

OF the various *Thalictrums*, one which recalls *T. dipterocarpum* is worthy of special mention. It is a shade plant, growing up in the thorn thickets to a height of 10 feet, where it bursts into a cloud of mauve stars. The flowers are larger and the leaflets smaller than in *T. dipterocarpum*.

Returning for a moment to the alpine region, there are several other interesting plants met with on the *Rhododendron* moorland, such as the giant *Rheum nobile*, which attains a height of 6 or 7 feet. Unlike the Chinese *R. Alexandrae*, it does not occur in large colonies, but grows scattered on the slopes. The natives eat the young inflorescence, though the flavour is not particularly pleasant to our palates.

Another striking alpine is the purple-red *Nomocharis nana* (K.W. 5809). This flowers at the end of June, not being found much below 15,000 feet. The habit is that of *N. lophophora*, but the colour is a brownish or purplish red; there is only a single nodding flower on the stem, which grows less than a foot high. This was the only certain species of *Nomocharis* we found, though two other plants collected in fruit—if indeed they differ from K.W. 5809—may belong to that genus.

Several species of *Lloydia* were met with in the alpine region, a dwarf species with white flowers, and a brownish-orange flowered species being the pick.

In the early autumn, *Cyananthus lobatus* flowered in masses on stone heaps round the village fields. There is a small-flowered form of this species, from China, in cultivation; but it is a poor thing beside the large exotic-looking violet flowers we saw growing in such tropical luxuriance. In the alpine wet region is still another variety, which grows erect, instead of ramping and flopping about; this has flowers like the meadow form, however. Another notable species of *Cyananthus* has bright steely-blue flowers, and leaves covered with long silky hairs. It grows on steep gneiss cliffs in the dry region, and appears to be rather rare.

The *Boraginaceae* provided at least one first-class hardy plant which should do in the drier parts of the country, a species of *Onosma* with sky-blue tubular flowers, like Venetian glass. In habit it resembles the red-flowered *O. paniculatum*, but it is a smaller plant, not so shade-loving. In fact, it grows in almost pure sand of the river-bed, or on hard gravelly slopes, flowering in July. With it is sometimes found another altogether coarser species with purplish flowers, the bright blue-flowered *Cynoglossum amabile*, and a charming dwarf

Eritrichium, with minute sky-blue flowers, each scarcely larger than a pin's head, but gathered together into a tight sphere, borne on a short stem rising from the centre of a rosette of flattened leaves covered with a cobweb of white hairs. The effect of hundreds of these little blue puff-balls scattered over the bare gravel plain was very pleasing. Here and there on the cliffs, sometimes as high as 15,000 feet, one came across ferny clumps of the hanging *Isopyrum grandiflorum*, though it was not nearly so abundant here as it is in some parts of western China. As a matter of fact, it was commonest on the plateau, north of the Salween divide, and seed sent to England has once more germinated. In the same barren, treeless region, where for at least eight months in the year there is hardly a vestige of a plant to be seen, but where, in August, we found the cliffs lurid with flowers, I noticed in fruit a dwarf *Incarvillea*, which looked like *I. brevipes*. Plants actually in flower here were species of yellow and white *Sedum*, one or two *Aconites*, the violet *Dracocephalum tanguticum*, *Meconopsis horridula*, and a brilliant crimson *Allium*. High up on the loftiest scree, at 17,000–18,000 feet, grew an astonishing variety of plants, including two species of 'Nivalis' *Primula* (probably *P. carnosula* for one), the woolly Labiate *Eriophyton Wallichianum*, several Saxifrages, a yellow poppy allied to *Meconopsis brevistyla*, a *Saussurea* and other *Compositae*, and the extraordinary creeping gentian, *G. amoena*.

Amongst woodland plants, mention may be made of *Pyrola Forrestii*, a Chinese species, *Adonis thalictrifolia*, which is also Chinese and, it may be added, a very charming plant, and, in the pine forest, a fine 'Martagon' lily with fragrant pink flowers, speckled purplish-crimson. This plant grows 3 feet high and bears a dozen to twenty flowers, the flowering season being July and August. Shade, good drainage, and plenty of soil depth are its chief needs.

The only other lilies we met with in Tibet were *L. giganteum*, in the Tsang-po gorge, *L. hyacinthinum*, and, in a garden, the Chinese *L. Davidii*, probably introduced by the Chinese themselves when they overran this part of the country twenty years ago. In Bhutan, however, we met with still another, also growing on dry pine-clad slopes, but as it was not in flower I am not at all sure of the species.

Two beautiful little Saxifrages occur in the dry winter alps, the one with purple nodding flowers borne singly on leafy stems, the other with flowers of butter-yellow, carried similarly. Both grow in clumps, on shady banks, or amongst the dwarf *Rhododendrons*. Many other species were met with on the rocks, especially at high altitudes—tufted plants, cushion plants, big-leaved 'Bergénias,' or small-leaved 'Hirculus' or 'Diptera'; but the above mentioned were by far the most striking, and the only ones likely to prove really valuable introductions. Here also occur many species of alpine *Anemone*, especially of the 'Narcissiflora' type, with white or bluish, or even purplish-red flowers; some of these, with thick fibrous rootstock, must be many years old.

Twining plants are not very abundant in the cold temperate region. *Codonopsis convolvulacea* occurs commonly in the dry valleys, in hedges and thickets by streams. *Clematis montana* is also quite common, but there are few other species of *Clematis*, nor did we find any vines until we went through the gorge. On the alpine Rhododendron moorland grew an erect *Codonopsis* like *C. tibetica*. A small white-flowered Androsace, like *A. Henryi*, grew by the river, at the entrance to the gorge, and at the other extreme, on the cliffs at 14,000 feet, grew a cushion plant with flowers nearly the colour of *A. coccinea*—cinnabar-red. The only other species of note was the giant *A. spinulifera* already referred to.

Most of the plants of horticultural merit collected in the dry winter region have been mentioned in the foregoing sketch, but the list of plants given is of course very incomplete botanically. I have said nothing of such genera as *Cremanthodium*, of which species were found in forest and meadow; *Phlomis*, *Salvia*, *Plectranthus*, and other Labiatae (including undershrub species); *Cochlearia*, *Draba*, *Cardamine*, and certain other Cruciferae from the high alpine zone; *Drosera*, *Tofieldia*, and numerous species of *Polygonum* from the meadowland; ground orchids from the forest or bog; autumnal *Swertias* from the Rhododendron moorland; and many other flowers of little or no horticultural interest, either because they are not sufficiently excellent, or because, being sub-tropical or sub-arctic, they would not thrive. And before passing on to the much more prolific wet winter region south of the Tsangpo, I may fitly close with a brief description of *Gentiana Wallonii*, the last flowering plant collected north of the river.

This magnificent gentian was in full bloom on October 14, at an altitude of about 10,500 feet, growing on dry sandy banks in masses, under the bushes of scrub oak. It grows just where *Primula pulchelloides* and the big Androsace grow, and outwardly rather resembles *G. asclepiadea*. The stems, which arise in a sheaf from a big rosette of dark-green polished leaves, grow 2 or 3 feet high, and in the autumn are so many leaning spires of radiant sapphire-blue. As the plant grows socially, facing the autumn sunshine, the effect of these piercing blue cups, climbing up the stems till they pull them down and interlace them in gleaming flashes of intense azure, may be imagined.

I pass on now to the flora of the Assam Himalaya and the gorge of the Tsangpo.

On Namcha Barwa and the other great snow-peaks between which the Tsangpo forces its way, the snow-line is low, in the neighbourhood of 15,000 feet. The climatic feature of this region is perpetual precipitation, that is to say, there is no dry season. Rain or snow falls every month in the year. Below 7,000 feet no snow falls, though sharp frosts occur; but here we begin to get a combination of heat and moisture. In the alpine region, on the other hand, we find the opposite extreme, seven months snow and five months rain. However, in regions constantly moist, whether the precipitation takes the

form of snow or rain, the result is a tremendous and varied growth of woody plants, and a proportionate decrease in herbaceous plants. One of the genera most affected by these conditions is *Rhododendron*. For every species found in the dry winter region, you find ten in the region of eternal precipitation.

Starting from the Tsangpo valley, they are met with in the following order. First, the undershrub '*Lepidotum*' and '*Lapponicum*' on cliffs right down in the valley; then the '*Triflorum*,' '*Taliense*,' and '*Souliei*' in the lower forest, and a little higher up the pink '*Barbatum*,' '*Grande*,' and pink '*Thomsoni*'; finally, in the *Abies* forest, the big '*Lacteam*'; all of which we have already seen growing on the other side of the Tsangpo, on the dry ranges. But now comes a great change. Even before we reach the upper forest limit and emerge into the alpine region, several new species have been met with.

On the gneiss cliffs grow another '*Barbatum*' with larger, rounder leaves, and another '*Triflorum*' with bright-red stems, as though dully lacquered; neither of these, however, did I see in flower. In the middle mixed forest, where Conifers and broad-leaved deciduous trees strive for dominion, grows a small bush '*Thomsoni*' bearing abundant trusses of four flowers, which are bell-shaped, hanging, and of the most intense fiery scarlet colour, each with five circular jet-black glands at the base. In the wet meadows grow clumps of *R. trichocladum*, whose flowers are a rather unpleasing greenish-yellow, with a rash of sickly spots peppered over the interior; in violent contrast to which are the regal purple trusses of a '*Saluenense*,' found lining the banks of streams.

But it is when we reach the alpine region that the greatest contrast is seen. Instead of the paltry half-dozen species met with farther north and west, there is a stupendous array in all the colours of the rainbow, and all shapes and sizes. A mere list of them is formidable. On the sunnier slopes—this only means where the snow first melts, for there never is any sunshine here, really—we find the undershrub '*Anthopogons*,' a pale yellow-flowered '*Souliei*,' and a pink-flowered '*Lacteam*,' with here and there a purple-flowered '*Lapponicum*' looking quite lost. Confined to the shadiest slopes and deepest snow-filled hollows are the '*Neriiflorums*,' '*Brachyanthums*,' '*Sanguineums*,' and others; while the grassy alps are dabbled with banana-yellow *R. mekongense* and purplish-pink '*Campylogynums*,' and the most barren gneiss slabs with creeping '*Scarlet Runner*,' one of the '*Forrestii*' lot.

Amongst the '*Anthopogons*' are the small cushion-forming big-leaved sulphur-flowered *R. Anthopogon* itself; a larger straggling undershrub species, growing sometimes 3 or 4 feet high, with brick-red flowers; a broomy plant with snowy-white flowers, growing a foot or 18 inches high; and another with pink flowers. Most of these grow together, mixed confusedly with the lovely apple-blossom *R. glaucum*, and with mats of the strawberry-flowered '*Saluenense*.' On the steeper rockier slopes will be a broad band of one of the bright



FIG. 68.—RHODODENDRON NUTTALLII IN SUBTROPICAL RAIN-FOREST.
DECEMBER.

[To face p. 228.

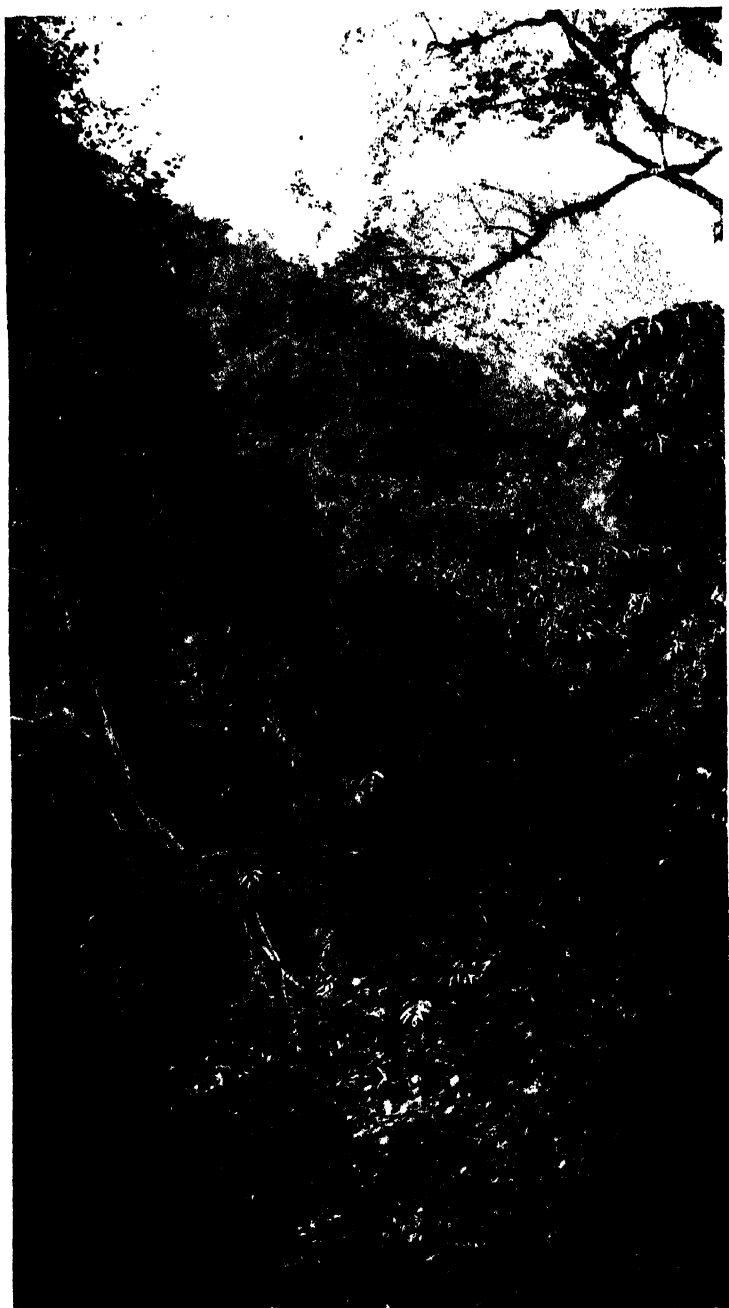


FIG. 69.—REGION OF CONSTANT PRECIPITATION, TIBET. SUBTROPICAL FOREST AT 6,000 FEET.



FIG. 70.—THE WET ZONE OF TIBET. ALDER, ETC.

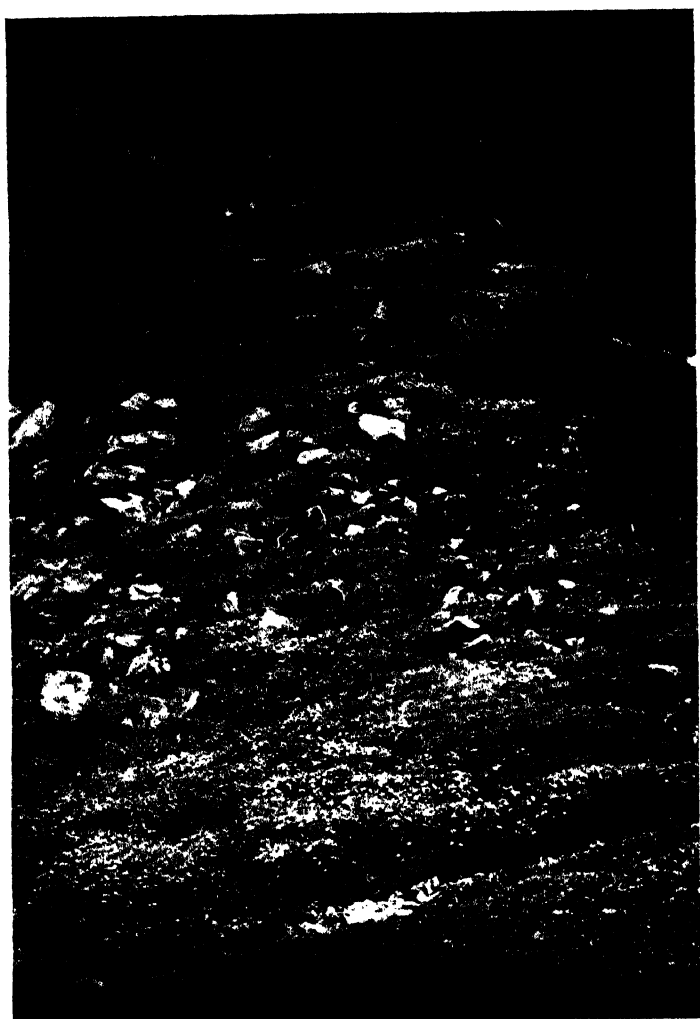


FIG. 71.—ALPINE REGION OF CONSTANT PRECIPITATION. CARPET OF DWARF RHODODENDRONS WITH MANY SPECIES.

[To face p. 229.

yellow-flowered 'Soulieis' (known to us as 'Yellow Peril,' since in places it threatened to swamp and overrun everything else), or tanglements of pink 'Lacteum'. The 'Souliei' was at least as remarkable in foliage as in flower, for though not particularly noticeable in the summer—probably because of the brilliant pools of colour all round—in the autumn the vivid verdigris bushes were very prominent, and stood out shrilly against the snowy background. One of the most wonderful of the smaller Rhododendrons, and also one of the rarest, was 'Plum Glaucum.' This plant formed loose broomy masses not much bigger than those of the Campylogynums, and considerably less compact and of smaller stature than those of Pink Glaucum. The leaves, too, were much smaller than those of Pink Glaucum, and not waxed on the reverse, where there were only scattered pit-like scales. On the other hand, the flowers were borne in the typical flattened Glaucum corymb, but, instead of being pink, were the rich dusky plum colour of *R. damascenum*. In fact, Plum Glaucum looked very much like a cross between Plum Warner and Pink Glaucum, with this reservation: an artificial cross nearly always shows a blending of parental characters, whereas in this example one saw not a blending, but a mixing—the characters of each were quite distinct and undiluted. I do not seriously suppose that Plum Glaucum was really a cross.

The Campylogynum Plum Warner (probably *R. glauco-aureum*) formed twiggy tufts all along the rock ledges of the ice-scored cliffs which faced north and were the first to be snowed up, and the last to be uncovered in June.

So great was the tangle, and so abrupt the change from one species to another, that it was really very difficult to decide what were the controlling factors. However, wherever the slopes were broken into clefts and ridged up with boulders, the hollows were filled with the 2-foot deep wire entanglements of Carmelita and Scarlet Pimpernel, two Neriiflorums. In general appearance these rather resembled each other and Scarlet Runner, but they were bigger plants with ascending, not prostrate, stems, larger leaves glabrous beneath, and flowers which were never solitary. Scarlet Runner has small leaves, with a pelt of fine hairs beneath, flowers of an intense burning scarlet solitary at the end of the shoot, and the whole plant lies absolutely flat on the rock, the flower itself, lying on its side, rising higher than any other part of the plant. When it reaches the edge of an escarpment, it hangs down in draping curtains from which in June dart tongues of fire visible a mile off.

Next in size comes Scarlet Pimpernel, with flowers in heads of three; the flowers, too, are a deeper shade of red, like dried blood. It was quite as common as Scarlet Runner, but demanded a more sheltered position. There was no possibility of confusing the two; in October Scarlet Pimpernel was already buried under 3 feet of snow, and its three-pronged fruit truss was still firmly closed, while Scarlet Runner by reason of its exposed position on the topmost slabs, from which the snow was blown in a fine frozen dust, lay with its solitary capsules

gaping like stars. The last named therefore can, and in fact must, stand much lower temperatures than the former.

Carmelita has still larger leaves and flowers than either of the others, the latter in trusses of three or four; they are a brilliant carmine in hue, perhaps the most brilliant and penetrating colour of all. The leaves are distinctive, almost oval in outline, very pale green below, darker above, and leathery. The capsules had to be excavated from the snow in October.

Very distinct was a *Campylogynum* with pinkish-purple flowers, which grew in a thin web all up the steep alpine turf slopes facing the sun. Here the first October snowfall melted rapidly, till the long thin capsules stuck through the crust, and were easily picked off, like small fingers. Another rather similar species had even pinker flowers, but it was more readily distinguished from the former by its longer style, not hooked. This latter flowered almost as well in the growing October snow-drifts as in the June melting ones.

Amongst this wealth of new forms, the snowy *Anthopogon* and strawberry *Saluenense* of the dry ranges were almost lost, though they occurred quite commonly. Indeed, the only species of *Rhododendron* which we found north of the river and not south of it was the *Oreotrephes*.

If the change from north of the river to south of the river was great as regards *Rhododendron*, the change from the north face of the Himalaya to the south face—the mere crossing of the Doshong La, 13,500 feet, was only less so. At the top conditions are pretty constant on both sides, and one finds the same *Neriiflorums*, *Brachyanthums*, *Campylogynums*, *Anthopogons*, and so on. But whereas on the north face the climate grows drier and drier as you descend to the Tsangpo at 9,000 feet; on the south face it grows hotter and wetter as you descend into the Dihang valley at 3,000 feet; the conditions on this side, in fact, are entirely favourable for the growth of *Rhododendrons* right down to the river, and for a much greater distance than on the north face, so that between 13,000 feet and 5,000 feet there is room for three or four strata of vegetation.

Immediately below the pass we found new species of all kinds growing thickly in a dense almost impenetrable scrub, composed partly of Pink *Glaucum*, but more especially of a whole new series of *Neriiflorums* with pink or white flowers, speckled variously. More remarkable still was a *Cinnabarinum*, like *R. Roylei*, but with bright orange flowers. The foliage is a shining metallic blue-green, which against the autumn snow is wonderfully vivid. A little below this the forest began, and was composed largely of a big-leaved *Rhododendron*, whose bright cinnamon-coloured wool on the reverse suggested the *Falconeri* series, as also did the great globular close-packed truss of fleshy white flowers, each with a violet flash at the base. But there were not the 10 lobes to the corolla, 20 stamens, and 10-celled ovary seen in most *Falconeri* *Rhododendrons*, and the leaf also suggested the *Fulvum* series. In the open, growing on the fringe of the forest, this species

formed a stout tree 20 or 25 feet high, but it also grew socially as a great tumbling bush.

Next came a bush species with very bristly shoots, petioles, and fruits, the bristles ending in glands which exuded a sticky substance. This was no doubt one of the *Barbatums*, allied to *R. strigillosum*, but as I did not see it in flower I am unable to give further details. It was common in thickets by streams and on wide meadow flats where there was no thick forest, growing with the pink and also the scarlet *Thomsoni*. Just below were thickets of a buff-leaved *Grande*, and here also occurred a curious shrub species, with long, narrow, rather pointed leaves with a rust of scales beneath, like a *Heliolepis*; but the curiosity lay in the fact that the flowers—or, as I saw it, the capsules—were borne directly on the old wood and not at the ends of the shoots. These capsules, which grew in threes, were the most absurd little things for the size of the plant.

Continuing the descent to about 7,000–8,000 feet altitude, one came into continuous thick forest, composed chiefly of the huge-leaved *R. grande*—the leaves are often 2 feet in length—and Conifers. The big trees were all heavily festooned and cushioned with moss, and covered with a wealth of epiphytic plants, ferns, orchids, and small shrubs; and amongst these latter were several very interesting baby *Rhododendrons*, of the *Edgworthii* and *Camaelliflorum* type; but none of these did I see in flower, though I got seed of them all.

However, I shall give a very one-sided idea of the flora if I mention nothing but *Rhododendrons*; and though they were the outstanding feature of the southern ranges, and furnished the most striking horticultural novelties, there were many other plants worthy of more than passing notice. Having, therefore, descended to about 8,000 feet in the temperate rain forest of the Assam Himalaya, let us retrace our steps to the alpine region, noting the flora.

Amongst the rather scanty undergrowth of this rain forest was a species of *Podophyllum* and a species of *Arisaema*; while in the thickets above, *Enkianthus*, *Vaccinium*, *Gaultheria*, and other *Ericaceae* were abundant. In the topmost strip of forest, where the *Falconeri* or *Fulvum Rhododendron* grew, one saw larch, *Prunus* (a gnarled dwarf cherry with almost black fruits), *Viburnum* (a species which turned glowing colours in October), *Euonymus*, *Salix*, *Lonicera*, and other shrubs; herbaceous plants included a *Meconopsis* like *M. simplicifolia*, *Nomocharis*, and other flowers. But it was in the real alpine region that the greatest wealth and the most curious forms of flowers were seen, especially in the genus *Primula*. Perhaps the most interesting was *P. falcifolia*, which we called the Daffodil *Primula*, by reason of its colour and fragrance. Its narrow leathery saw-edged strap-shaped leaves, fat mucilaginous collar, and large flattened slightly oblique flower at once suggested the section *Nivalis*; nor was this determination vitiated by the form of the seed, or by the fact that the flowers were generally solitary, or occasionally in pairs, since they are often quite few in this section, and in *P. Coryana*, for

example, are reduced to three or four. But despite such obvious *Nivalis* characters, the globular capsule was quite unlike anything seen hitherto in that section.

P. falcifolia grew, if not actually in bogs, in soil so drenched as to be quite waterlogged, often on steep alpine turf slopes, with the alpine form of *Cyananthus lobatus*, *Nomocharis nana*, and another pretty *Primula*, one of the *Candelabras*, called *P. Morsheadiana*, or the Golden *Primula*. In habit this last recalled the Burma-Yunnan species, *P. serratifolia*, but the flowers instead of being bicolor were a pure butter gold. Both *P. falcifolia* and *P. Morsheadiana*, like some of the dwarf *Rhododendrons*, flowered again freely in the autumn, in spite of the snow, the only difference being that *P. falcifolia* was then scentless. Another remarkable *Primula* was *P. Dickieana*, which has some extraordinary colour varieties, as violet, grey, bright canary yellow, and white. The colours tend to segregate, which suggests that they breed true. *P. Dickieana* also grows on the most sodden turf slopes, fed with perpetual streams of water from the melting snow above, as well as being surrounded by a mist bath. Its distribution is significant. Eastwards it occurs as far away as the Salween-Irrawaddy divide, where I collected it in seed in 1922; westwards it is known in Sikkim. This is practically the distribution of the *Neriiflorum Rhododendrons* also.

Cherry Bell, or *P. Valentiniana*, is a charming dwarf *Amethystina* *Primula*, another inhabitant of these rain-soaked ever moist alpine heights, which rejoice in seven months' sleep under the snow and five months' activity during the summer drizzle. Its cherry-red nodding flowers, raised only an inch or two off the ground, sheet the turf in June wherever it appears between the melting snowdrifts.

Most of these plants are likely to take our winter conditions amiss; and the best thing to do, at least with the larger species, such as *P. falcifolia*, would probably be to grow them as genuine bog plants, summer and winter.

On the rocks the rosy stars of *P. rhodochroa* were a brave sight, and there were mats of the vivid crimson *P. philoresia*, a species closely allied to the Chinese *P. dryadifolia*. Other *Primulas* here were *P. Whitei*, a forest species of the *Petiolaris* type, and the lovely gamboge *P. chionota* of the same series. The Sikkimensis *Primulas*, however, *P. Florindae* and *P. microdonta* var. *violacea*, which were such a great feature of the sub-alpine meadows north of the river, were only seen in the lowest meadows on the Tsangpo side of the Himalayan range, though indeed they were common enough here; but there was no room for them amongst the welter of *Rhododendrons* and other shrubs on the south face, and alpine herbs were altogether uncommon here. A few species of *Pedicularis*, *Lloydia*, *Meconopsis*, *Diapensia*, and *Anemone* were collected.

As regards *Meconopsis* there was a purple-flowered form of *M. simplicifolia*, and in fruit on the topmost grass and gravel slopes I came on a species in fruit closely resembling *M. simplicifolia*; but that it



FIG. 72.—MECONOPSIS BAILEYI.

[To face p. 232.



FIG. 73 —*MECONOPSIS SIMPLICIFOLIA* IN ALPINE ZONE OF DRY WINTERS, TIBET.



FIG. 74.—PRIMULA MICRODONTA AND P. FLORINDAE (IN SHADE) BY STREAM IN TIBET.



FIG. 75.—ALPINE MEADOW AT 11,000 FEET. DRY WINTER REGION. PRIMULAS AND IRISES.

had a longer style and the plant produced twice as many scapes as plants found north of the river—six or eight, as against three or four by true *M. simplicifolia*.

In the winter, almost buried under the snow, I found the narrow linear-pointed capsule of a *Cumminsia Meconopsis* just protruding. This could not have been the yellow-flowered *M. Florindae*, which is a woodland plant, but probably it was the blue-flowered *M. lyrata*, which is known both from Sikkim and from the Burma-Yunnan ranges. Generally speaking, however, the genus does not flourish in the regions of constant precipitation, and we met with at most four species here, compared with at least nine species on the dry winter ranges. Only *M. simplicifolia* and *M. Baileyi* were common to both regions.

Apart from *Rhododendrons*, there were comparatively few shrubs in the alpine region here. Two or three species of dwarf willow were remarkable for their long erect flower spikes, sometimes as much as 6 inches high. There were also species of *Berberis*, though of no unusual merit, *Cassiope*, *Ilex* (rather like *I. Pernyi*), and *Lonicera*. Amongst the latter was one remarkably beautiful shrub, a new species with glaucous foliage, velvet violet shoots, rich plum-purple flowers, and large blue-black berries. This plant was decidedly rare, and I met with only a few specimens growing amongst a thick tangle of *Rhododendrons* and other gnarled shrubs on a steep rocky face. The flowers were just opening at the end of June, and I collected seed of it in the last week of October, when everything at this altitude was under snow.

There is a much greater variety of trees south of the Tsangpo, for this region of perpetual precipitation is better suited to tree growth than to anything else. Even in the alpine region, with its seven months' rigorous imprisonment under snow, woody plants, as we have seen, far predominate over herbaceous growth, since there are few places where if the latter can grow the former cannot also; though the woody plants, at least in the ultimate zones of vegetation, belong almost entirely to one genus.

But as soon as we leave the true alpine regions behind, and enter the forest belt, this greater variety becomes apparent, and by the time we have descended a few thousand feet, where snow rarely or never falls, and where consequently rain falls every month of the year, the forest grows with almost tropical luxuriance; indeed, from about 6,000 feet downwards, the vegetation may be described as sub-tropical.

The sequence at the Doshong La * is as follows. The first trees met with, forming continuous forests, are larch and the Falconeri or *Fulvum Rhododendron*, already described. Ignoring bushes, which may under favourable conditions form small trees, we next come to extensive forests of *Rhododendron grande* (or *R. sino-grande*), and *Abies*, followed by *Picea* and *Tsuga*, still mixed with big-leaved

* See map, *Geographical Journal*, February, 1926.

Rhododendrons. Then comes a belt of deciduous-leaved forest, containing the largest trees of all, species of oak, birch, maple, Magnolia, Fraxinus, and other trees, together with a few Conifers (species of Pinus and Juniperus), and a great variety of bushes and shrubs; climbing plants such as Vitis, Clematis, Akebia, Schizandra, and even Ficus; epiphytic ferns and orchids, Rhododendron, Agapetes, and so on. The Rhododendrons of this belt are *R. Maddeni*, and allies, several of the scarlet-flowered *Irroratum* type, and an *Arboreum*; whilst the commonest epiphyte is *R. vaccinioides*.

Finally we come down into evergreen forest once more, but now it is of the broad-leaved variety, typical Indo-Malayan hill jungle. Characteristic plants and types of vegetation are bamboos in great variety, Musa, Calamus, and one or two other palms, species of Ficus, Acacia, etc., with Pinus in dry places. The Rhododendrons are *R. Nuttallii*, and others of the *Maddeni* series with leathery leaves and pink flowers; a species allied to *R. indicum*, and some others. Species of *Strobilanthes*, *Crawfordia*, *Curcuma*, *Skimmia*, *Codonopsis*, etc., are common in the forest; and epiphytic orchids include species of *Dendrobium*, *Cymbidium giganteum*, *Cirrhopetalum emarginatum*, etc.

But the flora of the Tsangpo gorge requires a chapter to itself.

THE PREVENTION OF INSECT ATTACKS IN GARDENS.

By G. FOX WILSON, N.D.H., F.E.S.

[Read January 25, 1927; Mr. J. C. F. FRYER, M.A., in the Chair.]

IN introducing the subject of the preventive measures to be taken against insect attack in gardens, it will make for clarity to quote the words of Dr. GUY MARSHALL, Director of the Imperial Bureau of Entomology. Addressing the delegates to the Imperial Entomological Congress in London in June 1925, he said, "There is a tendency to create in the minds of farmers and planters the idea that an entomologist is merely a person who can be called in to assist in coping with insects when they have become so numerous as to cause serious damage to their crops; in other words, that the functions of the entomologist are merely curative. This idea is radically unsound. If entomology is to yield its fullest benefits to mankind, the insects must be destroyed before they have become pests, and their control must be just as much a part of normal agricultural (and we may add horticultural) routine as is the control of weeds."

Within recent years, we have heard a great deal about preventive medicine but far too little about the prevention of insect pests and fungus diseases. In order to prevent attack one must do away with the source of infection, and this can be carried through only by attending to hygienic methods of cultivation and carefully regulating the food supplies of plants so that their vitality is kept at the high level which enables them to withstand attack by insect pests and fungus diseases. We find the same principle operating on plants as in animals—when the vitality is lowered by some means or other the individual is unable to throw off the effects of attack.

It is important to prevent the presence of insects and other arthropods in gardens and farms, not only for the direct damage they do to plant life by either biting the leaves, stems, and roots, or sucking the plant juices, but for the indirect damage that is done by (i) lowering the vitality of plants and laying open a way for fungus and bacterial diseases (example—woolly aphis is often the precursor of canker), and (ii) the danger of disease transmission directly through their presence on the plant; this we see in the spread of virus diseases (e.g. mosaic and leaf-curl) by haustellate insects such as aphides, capsid bugs and leaf-hoppers.

It is not intended in this paper to devote any time to the discussion of mechanical and chemical control of plant pests, but to outline certain suggestions for preventing insect attack. One word of warning may be given here on the matter of spraying, i.e. that this operation is too often performed with faith by amateurs and used in much the

same way as a patent medicine. Speaking generally, spraying against pests before they are present is a waste of time, labour and material.

In our present state of knowledge it is impossible entirely to eliminate the presence of insect pests in our gardens, but far more can be done than is at present done to keep their numbers within reasonable bounds.

Let us see what factors go towards the encouragement of injurious insects.

(1) *Abundance of Food.*

Under natural conditions, there does not occur the area of one particular food plant to the exclusion of all others. In horticultural practice there is mass production and an intensive cultivation is aimed at—this is particularly noticeable in market gardens, and under such conditions insects have not far to seek for food.

(2) *Favourable Climatic Conditions.*

The effect of climatic conditions on the fecundity of insects varies with the species. Many exotic species of insects are annually introduced into this country, and while some become naturalized to our climate many are unable to adapt themselves to the changed conditions (e.g. San José Scale). The question of the effect of mild and severe winters on the incidence of insect pests may be mentioned, for it is found that severe winters favour phytophagous species but are less favourable to predaceous species. Many species of aphides are able to reproduce throughout a mild winter, and this can be seen on rose bushes. A mild open winter, with late frosts is less favourable to insect pests than a winter with a prolonged period of severe weather. Connected with weather conditions is the question of soil cultivation. The higher the rainfall the more thorough should the drainage system be—similarly in heavy clay soils the question of efficient drainage is of paramount importance, not only for the thorough aeration of the soil but for the preference shown by certain pests for moist conditions. Leather-jackets show a preference for wet soils, and we find the moist conditions of certain parts of the British Isles (viz. South-West of Scotland) suitable for their multiplication.

Consideration should always be given to the requirements of plants as to whether they are sun-loving or shade-loving, whether they require an open situation with plenty of air circulating round them or whether they prefer a humid and still atmosphere. Failure to observe their requirements is to court disaster by lowering vitality and opening a way for pests and diseases.

Working on the bean aphid, Dr. DAVIDSON * has shown the influence of light, temperature and humidity on the degree of infestation of broad beans. Similar observations carried out with other pests

* DAVIDSON, J., *Ann. App. Biol.*, xii. No. 4, Nov. 1925, pp. 472-507.

would show the influence that climatic conditions have on the degree of infestation.

(3) *Absence of Natural Enemies.*

- (i) Insectivorous birds are discouraged by the replacement of hedges by fences, the destruction of woodlands and copses, the draining of pasture land and the conversion of moorland into arable land.
- (ii) Ignorance concerning them leads to the destruction of predaceous and parasitic insects. Many carnivorous Carabid larvæ are annually destroyed in mistake for wire-worms. The pupæ of cabbage white butterfly parasites are mistaken for caterpillar "eggs" and destroyed. Numerous ladybird larvæ are killed because they are not recognized as beneficial insects.
- (iii) Freedom of pests from fungal, bacterial, and protozoal diseases.

(4) *Disregard of the Hygienic Principles of Plant Cultivation.*

This factor is almost entirely in the hands of man to alter, and we will now consider the various principles which underlie clean cultivation and which can be carried out in our gardens. The late Prof. MAXWELL LEFROY* outlined the preventive principles for orchards, they were (1) clean up rubbish, (2) have no grass, (3) have open fences and clean ditches, (4) remove dead wood, (5) cut off soft shoots, (6) tar pruned surfaces, (7) winter wash, (8) control wild food plants, (9) maintain a summer spraying sequence, (10) grease band, (11) codling moth band, and (12) collect windfalls. We will broaden our remarks to include the whole garden, i.e. the flower and vegetable gardens and the fruit plantation.

The following hygienic principles of control are confined to insect pests, for when disease prevention is aimed at there are many other factors which come into play.

I. Treatment of the Soil.

Efficient drainage and thorough cultivation are the two most necessary factors for maintaining health in plants.

Deep digging and trenching the soil, particularly in the vegetable garden, are most useful operations, and a certain area of the kitchen garden should be trenched each year. These operations are useful for controlling pests in two ways: (i) by burying pupæ (e.g. the celery fly) too deep for the adults to emerge, and in heavy soils the buried pupæ are asphyxiated, and (ii) by exposing larvæ (e.g. surface caterpillars) to the effect of frosts and enabling poultry to feed on them. After digging, a poultry house should be placed on the garden and the area surrounded with 2 ft. wire netting. In the fruit plantation

* LEFROY, H. MAXWELL, *Jour. R.H.S.*, xli. Pt. 1, 1915, pp. 28-39.

the presence of poultry throughout the spring and summer is to be encouraged, for they feed on the larvæ of the pear midge, and upon the raspberry beetle and the clay-coloured weevil, and in winter they will feed on the apterous females of the winter and mottled umber moths as they emerge from the soil. The heavier breeds are preferable in orchards to the lighter breeds.* Use 'White Wyandottes' and 'Rhode Island Reds' rather than 'Leghorns,' as the last mentioned are liable to fly up into the branches. Ducks ('Runners' and 'Khaki Campbells') may be used in the vegetable garden after digging has ceased. Another operation which has a beneficial effect is hoeing, as the constant disturbance of the soil is harmful to such pests as raspberry beetle, surface caterpillars, leather-jackets and swift moth larvæ. Lawns which are constantly kept rolled are less liable to attack by leather-jackets than unrolled areas.

Insects thrive best in neglected and badly cultivated ground, and comparatively few insects are found in well-worked soils in winter compared with the number in grass and undisturbed land.†

II. Crop Rotation.

A great deal of preventive work may be done by the judicious rotation of crops.

In the vegetable garden, crop rotation should be practised not only for the manurial benefits obtained by such cropping but from the standpoint of pest control, and there are far too many gardeners who neglect the advantages accruing from such rotation. However small the kitchen garden, it is wise to remove a crop to a position as far as possible from the previous year's site, as this compels migration of such pests as onion, cabbage and celery flies.

III. Sowing of Seed.

Varying the time of seed sowing will often prevent an attack by insect pests. To get plants to become well established before a pest arrives is to be aimed at, but it is only applicable to certain plants, e.g. onions which are sown under glass and transplanted are less liable to attack by fly than those sown in the permanent quarters. In certain areas where some particular pest is prevalent a surplus of seeds should be sown, e.g. turnips and cabbages against flea-beetles. In the case of carrots, however, thin sowing should be attempted, for the thicker they are sown the more thinning is required, and the subsequent crushing of the foliage attracts the carrot fly from surrounding hedge plants such as *Heracleum*.

Seed beds of cabbages and other brassicas, and celery should be screened with cheese-cloth fixed on a lath frame to exclude the cabbage and celery flies respectively.

It should be the aim of all gardeners to obtain good seed from reliable seedsmen, as inferior seed is unsatisfactory not only from the

* THEOBALD, F. V., *Seale-Hayne Agric. College Mag.*, December 1921, 3 pp.

† BUCKLE, P., *Ann. App. Biol.*, viii. Nos. 3-4, Nov. 1921, pp. 135-145.

poor germination that is obtained but the fact that many seeds carry insect pests and fungus diseases. Bean and pea seeds may be attacked by beetles (*Bruchus rufimanus* Boh. and *B. pisi* L.), and these unwanted insects are often introduced into gardens in seeds. Again, French bean seeds imported from Canada and the United States are sometimes found to be attacked by another species of *Bruchus*, *B. oblectus* Say., which is able to breed in stored seeds, whereas our own species of *Bruchus* do not attack other seeds when stored. All infected material should be fumigated with carbon bisulphide before sowing. Carrot seed has been sent to Wisley infested with *Sitodrepa* (*Anobium*) *panicea* L.—an unwanted introduction, as it breeds in many household goods, e.g. flour, bread and biscuits.

IV. Stimulation of Plant Growth.

The application of carefully selected fertilizers to attacked plants is essential from a stimulating standpoint. Onion seedlings attacked by onion fly, mangolds and beetroot attacked by leaf-miner and turnip and cabbage seedlings attacked by flea-beetles need a stimulant in the form of a quick-acting manure in order to carry them over a period of lowered vitality, for rapid growth is necessary to enable plants to grow away from attack.

One of the best manures for this purpose is nitrate of soda, using it at the rate of 2 oz. to the square yard at stated intervals. Sulphate of ammonia is also useful, but its action is slightly slower.

On the other hand, an excess of nitrogenous manures (nitrate of soda, sulphate of ammonia, and farmyard manure) tend to produce lush, sappy growth which is conducive to aphid attack. When these soft shoots occur on apple and pear trees, one finds them covered with woolly aphid and mealy apple aphid. Highly cultivated plants are particularly susceptible to attack by sucking insects (aphides, capsid bugs and leaf-hoppers). Mulching of fruit trees will often encourage cockchafer attack. It has been found that mulched apple trees are attacked to a greater extent by cockchafer larvæ than those left unmulched. Also mulched plum trees were more susceptible to attack by leaf-curling aphid than untreated trees.

Soot is readily obtained, and is used as a deterrent against such pests as onion fly. Other deterrents such as basic slag and kainit do not kill, but prevent the female insects from laying their eggs on dusted plants.

DAVIDSON* working with the bean aphid (*Aphis rumicis*) found that beans which were grown in soil treated with complete mineral manures became slightly more heavily infested than those grown in unmanured soil. Again, bean plants supplied with increased potash gave increased infestation figures, whereas with low potash a decrease was obtained.

V. Destruction of Weeds.

Before we consider this essential operation in garden cultivation, we will consider the two main groups of insect pests: (i) the mandi-

* DAVIDSON, J., *loc. cit.*

bulate insects, those with biting mouthparts, and (ii) the haustellate, those insects with sucking mouthparts. Now these two groups may be subdivided into (a) monophagous species, those insects which feed only on one host plant, e.g. the Beech Coccus, which does not attack any other plant but beech, and (b) polyphagous species, those insects which possess several host plants. From a gardener's standpoint the polyphagous species are the ones to be feared most of all, for some species which were once weed-feeders have changed their habits and have become pests of cultivated plants. This has occurred with the Rosy Rustic moth, *Hydroecia micacea* Esp., which at one time confined its attention to weeds such as docks and plantains, but now has become a pest of potatoes and rhubarb.

Weeds should be kept down by hand-weeding and hoeing, not only in the flower garden, where they are unsightly, but in the vegetable and fruit gardens and in the surrounding hedgerows and waste ground. Charlock and other cruciferous weeds should be prevented from growing in the vicinity of the vegetable garden, as they harbour many pests such as flea-beetles and gall weevil. Many examples could be cited, but a few will suffice. Celery fly will breed on species of *Heracleum*, such as the cow parsnip which is a common inhabitant of hedgerows and headlands, and on the corn thistle, *Cnicus arvensis*. Several species of *Agrotis*, the larvæ which are known as surface caterpillars, are found feeding on grass and other wild plants in headlands and rough places round gardens. The tarnished plant bug, *Lygus pratensis* L., feeds normally on nettles, sheep sorrel and *Erigeron canadensis*, and will migrate from these wild hosts to cultivated plants, e.g. Chrysanthemums and Dahlias. This was particularly noticeable at Wisley in 1921 during the great drought of that year, for many of the wild food plants of this pest died out or wilted through shortage of water and large numbers of these bugs migrated to the Dahlia trial, where they did much damage. Most aphides show migratory habits from winter to summer host plants. The winter host is either a particular plant or may consist of a few closely allied species which are usually woody-stemmed. The summer host plants may be numerous and are usually botanically related. The cherry aphid, *Myzus cerasi* F., may be cited as an example, for the winter and spring host of this species is the cherry and the late summer host is a common weed of hedgerows, *Galium aparine*, one of the "bedstraws."

Although numerous other examples could be given, the above show the importance of weed eradication in gardens and in the environs as far as this is practicable.

VI. Conversion of Headlands and Waste Ground round Gardens into Arable Land.

It is often seen that in the vicinity of the kitchen garden and fruit plantation there is a strip of varying width of rough grassland left between the cultivated area and the boundary fence. In this area

one finds many weeds, e.g. docks, plantains, dead-nettles, and various grasses. Several insect pests (diamond-back moth, surface caterpillars, leather-jackets and wireworms) are clearly traceable to these areas,* which should be broken up and, if not planted, should be kept constantly hoed and free from weeds.

If cultivation is out of the question, a shallow trench, 4-6 inches deep, should be made at the edge of the waste area and a barrier formed by placing in the trench an arsenic bait composed of bran and Paris Green. If this is done at intervals during the summer and autumn, a great number of surface caterpillars and leather-jackets will be enticed to the bait and poisoned. In light soils a convenient trench may be made by using a heavily weighted barrow.

VII. *Destruction of Crop Remnants.*

Encouragement will be given to the cabbage gall weevil (*Ceutorhynchus pleurostigma* Marsh.) if galled roots are left in the ground after the "heads" are removed, or if the roots are thrown on to the rubbish heap and left. Such material should be deeply buried or placed on the hot ashes of a garden fire. Similarly, eelworm-infected material should not be thrown on to a heap of rotting vegetation for transference back to the garden as manure. Prunings of fruit trees and ornamental shrubs on which may be found the eggs of many pests and in which bark beetles may be present should be burnt and not left lying on the ground around the plants. Dying and dead branches of fruit trees and shrubs should be burnt as soon as possible, for they might contain some species of bark beetle or wood-boring insect which if kept would complete their life-history and emerge to prove a nuisance to other trees.

VIII. *Removal and burning or burying of Rubbish in which Pests hibernate.*

A favourite position chosen for hibernation of pests, e.g. bean and pea weevils (*Sitones*), flea-beetles, woodlice, and slugs, is in an accumulated heap of leaves beneath hedges and alongside fences. Hedges should always be kept clear of rubbish and ditches free from weeds and leaves which prevent the running away of surface water and provide ideal breeding-places for mosquitos.

Heaps of old bricks and flower-pots are ideal places for snails to hibernate amongst, and all such litter should be broken up and used either as a foundation for paths in the kitchen garden or for placing on the top of land drains. In my own garden I found recently beneath a cracked 12-inch pot sixty-eight hibernating snails. Too often one meets with an accumulation of paint tins, insecticide cans and broken watering-cans thrown down in some out-of-the-way corner of the garden, and in such places one can find many pests hibernating, and

* MILLS, H. W., *Ann. App. Biol.*, viii. Nos. 3-4, Nov. 1921, pp. 170-181.

there is also the danger of water collecting in the tins and providing habitats for mosquito larvæ.

Bundles of old pea sticks, heaps of cut grass and pulled weeds all provide danger spots, and should be examined for the presence of snails and other garden pests. During the winter months one should examine fences and walls surrounding gardens for the pupæ of the cabbage white butterflies and hibernating snails. Stone, brick, wooden and box edgings to flower beds are favourite hibernating quarters for slugs and woodlice.

Loose bark on posts to which wire netting and fencing are attached should be removed, for beneath the bark may be found apple-blossom weevils, bean weevils, besides such beneficial insects as ladybirds. In many gardens are to be seen old fruit trees covered with lichen and old bark; such should be removed by scraping and scrubbing with caustic soda (1 lb. to 10 gallons of water). LIGHT * recorded the presence of ninety species of insects, of which nineteen species were serious pests of garden plants, beneath the bark of neglected apple trees in the Bristol district.

IX. *Isolation of Clean Areas from Infected Areas.*

Barriers which include grease bands should be applied in early autumn to all half-standard and standard fruit trees and ornamental species of *Pyrus* and *Prunus* in order to capture the apterous females of the winter and mottled umber moths, leaving the bands on until June in order to capture the apterous March moth females, migratory woolly aphides and caterpillars such as those of the Green Pug moth. Smaller bands are often useful for attaching to the stems of standard roses to prevent ants from reaching the shoots and conveying aphides from plant to plant. Again, grease bands should be applied to the stems of choice standard rhododendrons to prevent weevils (clay-coloured and vine) from ascending and spoiling the foliage by biting holes in it. It is well to mention here that all ants' nests should be destroyed in gardens, as they prove a constant nuisance by carrying aphides from one plant to another.

Cabbages planted near a headland will prove a good barrier for surface caterpillars and may be used as a trap crop or barrier against these pests.

X. *Care of Hedges and Shelter Belts.*

The danger from most of the deciduous hedge plants is that they "carry over" pests from one year to another.

Hawthorn or "Quick" is a favourite hedge on account of its speedy growth and impenetrable nature, yet it is the worst offender in this matter. LEFROY † mentions 21 insect pests of fruit trees which feed on *Crataegus*, and there are 203 species of European insects which

* LIGHT, S., *Ann. and Mag. Nat. Hist.*, xvii. No. 97, Jan. 1926, pp. 126-149.

† LEFROY, H. M., *loc. cit.*

attack this plant. *Crataegus* is closely related botanically to apple, pear, plum, and cherry, and many insects which feed on hawthorn will readily migrate to neighbouring fruit trees. Hedges composed of hawthorn should be kept closely clipped—a convenient height being 5 feet—and if this is insufficient to keep down pests the hedge should be sprayed at the same time as the adjoining fruit plantation with either lead arsenate wash for leaf-eating insects or nicotine and soft soap wash for sucking insects. When any deciduous plant is used as a hedge or shelter belt, a careful watch must be kept for the presence of insect pests, and if they are present on them the plants must be sprayed against the pests concerned. Plants such as sloes “carry over” plum aphides, birches “carry over” leaf-eating weevils (*Phyllobius* species), maples “carry over” shot borer beetle (*Xyleborus*), and so on.

XI. Use of Trap Crops.

Although little time can be spent on discussing this means of preventing insect attack, it will be well to note that an inferior crop may often be used and grown simply for attractive purposes.

An early sowing of onions will provide plants on which the female onion flies will oviposit, and the crop may then be destroyed—this will account for the first brood of flies. Other cases are where lettuces are sown and grown simply for attracting wire-worms, whilst germinating wheat also provides an attractive bait in wireworm-infested land. French beans may be sown under glass for attracting “white fly” before tomatoes are placed in the house. Cress provides a favourable trap for flea-beetles before cabbages and turnips are sown. Three or four celery plants should be left over until May in order to attract the first brood of celery flies, and when larvæ are noticed in the leaves the trap plants may be pulled up and destroyed.

XII. Prevention of Pest Introduction on Plants.

The question of plant legislation will not be considered here, but rather the danger from introducing pests on plants obtained from nurserymen. Cheap articles are usually expensive in the long run, and it should be the policy of all gardeners to purchase plants from reliable nurserymen who have reputations to keep.

The following pests may be introduced on nursery stock: “Big Bud” mite on black currants; aphid eggs on fruit and ornamental trees and roses; woolly aphid and mussel scale on apple and ornamental *Pyrus* species; rhododendron bug on rhododendrons; “white fly” nymphs on tomato and cabbage seedlings which are being sold in markets, and eelworm in narcissus bulbs and many plants, particularly herbaceous phloxes.

Care should be taken when propagating plants that the particular pest is not present on the cutting, offshoot or divided portion. Bean and pea seeds should be examined for their freedom from beetle.

Also when obtaining loam for composts a critical examination should be made for the presence of wire-worms, root aphides and weevil larvæ, and if these are present the loam should be stacked in heaps and fumigated with carbon bisulphide.

XIII. *The Use of Resistant Varieties.*

Resistant varieties of plants are of two kinds: (i) those on which a particular pest will not feed, and (ii) those which become attacked but are able to withstand and throw off the harmful results attending attack.

A great deal of work has already been done on the determination of those varieties of plants which are susceptible and resistant to insect attack, but a great deal is still to be done on the determination as to what constitutes resistance and the factors which determine the degree of resistance.

Mention need only be made here of the work at East Malling on the susceptibility of apple stocks to the green apple aphid (*Aphis pomi* D.G.) and the woolly aphid (*Eriosoma lanigerum* Hausm.). Results show that whereas Type IV (Dutch) and Type V (Doucin Amélioré) were resistant to attacks by *A. pomi*, both these types were susceptible to woolly aphid. On the other hand, Type IX (Jaune de Metz) proved resistant to both these pests.

At Wisley work has been done on similar lines with the stem eel-worm (*Tylenchus dipsaci* Kuhn.) in herbaceous phloxes. It was found that the varieties 'Antonin Mercié' and 'Widar' were highly resistant to attack, whilst 'Rijnstroom' and 'G. A. Ströhlein' were most susceptible.

One other case may be noted, that is the resistance of the Hollander cabbage ('Danish Baldhead') to the attacks of cabbage fly in America; but when seed of this variety was sown at Wisley this variety did not show any resistance to the pest.

It has already been mentioned that highly cultivated plants are susceptible to insect attack, and the same may be said of sickly and very young plants. True resistance in a plant is due to some physiological factor, and whereas a plant in full vigour may prove resistant to a certain pest the same plant may be open to attack when some factor, e.g. unsuitable soil conditions, drought, or the presence of some disease, is present. It is well known that aphides and possibly other haustellate insects react to physiological changes in the host plant. In Britain all the bark beetles prefer to attack the less vigorous trees, and choose unhealthy and felled trees rather than healthy ones in which to breed. Such pests are known as secondary pests, and their presence in a certain tree indicates some adverse influence. The adverse influence of drought may be overcome to a large extent by constant hoeing. In the old plum plantation at Wisley, the majority of the trees were growing on light soil (Bagshot Sand) whilst a few rows were situated on heavier soil. A bad outbreak of shot-borer

beetle (*Xyleborus dispar* F.) occurred some years ago and attacked only those trees situated on the light soil, leaving untouched those growing on heavy soil. The conditions which hindered proper sap flow encouraged the presence of the beetles. At Wisley it is found that apple trees growing in grass are less liable to attack by apple aphides than those growing in cultivated ground, although the same variety is grown in both places. Other cases of plant endurance are mentioned by LEES * in a recently published paper.

Generalizations.

Disappointment and anger arise when a grower who aims at a high standard of garden hygiene has a neighbour who allows his garden to become a wilderness of weeds and a breeding ground of pests. Legislation against such growers has been hinted at, but happier results will be obtained by tactfully approaching the careless gardener and pointing out his errors and selfish attitude towards his neighbours. Much could be done by instilling into the minds of children the necessity of following out hygienic principles not only in regard to health of man and animals but also of plants. Instruction should be given in schools so that our common insects can be recognized and distinction made between foes and friends. This would do away with the ignorance too often seen where ladybird larvæ are killed and dragonflies accused of eating plants.

What does the future hold in the field of applied entomology ? (i) A better adherence to the principles underlying preventive measures. Meanwhile, chemical and mechanical control holds the field, and with the extended use of high-powered spraying machinery and aeroplane dusting there is a chance that pests will be kept in check, although we look for the day when not curative but preventive measures will be the order. (ii) Biological control of plant pests, i.e. the introduction and cultivation of parasitic and predaceous species of insects. There is an urgent need in this country for work to be done on the lines laid down in America, where every State is supplied with insectaries where beneficial species of insects are bred out and sent to gardeners and farmers. It is to be hoped that the scheme at present in hand for the breeding of parasitic insects in this country will materialize. (iii) The cultivation and selection of those varieties of plants which are resistant or able to endure attack by phytophagous insects.

We leave the subject with the sincere hope that the future outlook of gardeners will be the prevention of insect attack obtained by carrying out the general principles of plant hygiene, rather than the careless attitude displayed by many, but by no means all, horticulturists.

* LEES, A. H., *Ann. App. Biol.*, xiii. No. 4, Nov. 1926, pp. 506-515.

HOW THE SEEDSMAN OBTAINS HIS SEEDS.

By WALTER F. GILES, Chief of Seed Production Dept. of
Messrs. Sutton & Sons, Reading.

ALTHOUGH my paper is entitled "How the Seedsman obtains his Seeds" I should like to be allowed to make it a little more comprehensive in order that I may be able to give you not only some notes as to how and where seeds are produced and got ready for commerce, but also a little information as to how the seedsman obtains the new or improved varieties of Vegetables and Flowers which are from time to time to be found in the seed catalogues.

I have no doubt that many of you, when you have been looking around the Hall at the fine displays of Vegetables and Flowers grown from seed, have sometimes thought "I wonder how this or that came into existence, and how it attained its present perfect development?" And if the plant could speak, it would probably say, that generations ago it lived in a wild state, probably in a foreign land, and that it owed its present beauty or usefulness to the guiding hand of man.

In those far-off days a time eventually came when primitive man commenced to take a little intelligent interest in wild plants, probably first of all to provide himself with food more easily, and it is conceivable that he would, for the sake of convenience, plant some of the seeds near to his place of abode, and perhaps give them a little attention. Then these plants, as though grateful for a little notice being taken of them and their conditions of life improved, would doubtless do their best to grow into larger and finer specimens. It is reasonable to suppose that man of that day would not plant the worst, but would pick out some of the best to perpetuate his supply of seed, and so in a crude way, either consciously or unconsciously, the improvement of the plant would be begun. One of the most interesting subjects to refer to in this respect is that of the Brassicas, or, in other words, that great family of plants usually grown in every garden under the names of Cabbage, Savoy, Kale, Brussels Sprouts, Broccoli, etc.

All the hundreds of varieties of these subjects belong to the same family, and the supposed wild ancestor of them is still to be found growing wild on the sea cliffs around our country (fig. 76). Exactly when this wild type began to sport or to produce variations there is no record to show, but it must have been generations ago. But the fact remains that even at the time GERARDE published his famous "Herbal" in the sixteenth century, the developed types were still very crude indeed, as his illustrations show. But with the advent of the nineteenth century, improvements were made much faster in all branches

of Horticulture, and many new types were raised and brought into commerce.

At least nine extreme and distinct types of *Brassica oleracea* have apparently been developed from the Wild Kale, as they all readily intercross, and all cross with the wild type (fig. 77). Of several of these nine forms there are many distinct varieties, all differing from each other, and yet, under suitable cultivation and selection, retaining all their distinctive characteristics.

Why plants such as these and others should sport or vary cannot be explained. There is, however, something in nature which causes plants occasionally to do this, and it is by observing these variations and preserving them for seed that many new forms are in the first place produced. These new forms may not in themselves have much merit, but when nature has once produced them they will often respond to scientific improvement, and they can also be embodied in other plants of the same family by cross fertilization. It is at this point that the science and skill of the plant breeder is brought in, for he is able, by careful calculation, to know approximately how to combine in one new plant the good qualities formerly possessed by several. Two interesting combinations of some of the types may be mentioned, viz. a plant of Brussels Sprout with a Cabbage head, and a Brussels Sprout plant with a Savoy head, the Sprouts also being small Savoys. These types were produced by crossing the Cabbage with the Brussels Sprout, and the Savoy with the Brussels Sprout, and then selecting for several generations the plants giving the most solid heads, and the most solid Sprouts on the stem.

Thanks to the discovery of certain phenomena by GREGOR MENDEL, the Austrian monk, who recorded the results of his experiments in the cross-breeding of Peas about 1860, modern science has built up, since the wider publication of these results in 1900, what, as many of you know, is referred to as the Mendelian Laws of Breeding. The application of these Laws has practically revolutionized the raising of new plants, for whereas in years gone by all sorts of experiments had to be attempted to try to get a certain result, now the work can be approached with much greater certainty. If you will allow me, I will endeavour to explain a little of the work in question. MENDEL found that if he crossed two Peas together, one wrinkled seeded and the other round, all the seeds in the first generation resulting from the cross came round, but these round seeded Peas when sown came up approximately in the proportion of three rounds and one wrinkled. He found that the wrinkled seed would continue to produce nothing but wrinkled seeds; one of the round seeds would produce nothing but pure round seeds, but two of the round seeds would in the next generation each break up or segregate as the previous generation had done, into 75 per cent. rounds and 25 per cent. wrinkled.

Whilst one pair of factors only was being dealt with (i.e. Roundness and Wrinkledness in seed) no new types could be raised, but when

two pairs of characters are considered as in tall, round, and dwarf wrinkled varieties, i.e.

Tallness and Dwarfness
Roundness and Wrinkledness

it will be seen that these four distinct characters can be so blended as to form two new types, viz. tall wrinkled and dwarf round.

When the two parental forms show three pairs of contrasting characters, e.g.

Tallness and Dwarfness
Round-seeded and Wrinkled-seeded
Green-seeded and Yellow-seeded

and a cross is made between two such parental forms, the hybrid will segregate and produce the six new forms following :

Tall Round Yellow	Dwarf Wrinkled Green
Tall Wrinkled Yellow	Dwarf Round Yellow
Tall Wrinkled Green	Dwarf Round Green

Consequently, the more pairs of contrasting characters a plant has the more variation can be got from the cross, and when the desired new characters have been combined in any one plant, it can be taken in hand, and by careful cultivation and selection the good qualities can often be still further developed.

By this means a plant can (within certain limits) be more or less built to order, but it must always be remembered that in this work no new character is created, it is simply a reassembling or combining of characters already in existence. In addition to the three pairs of factors dealt with in the last experiment, in which six new types or combinations could be produced, the following are a few more of the pairs of simple Mendelian factors which can be bred into new types :

Colour of Pod	.	.	Pale <i>v.</i> Dark
Shape of Pod	.	.	Pointed ended <i>v.</i> Stumpy
Type of Pod	.	.	Normal or Constricted like the pods of Sugar Pea
Colour of Bloom	.	.	White <i>v.</i> Coloured

whilst such factors as

Early Maturity *v.* Late Maturity
Single poddedness *v.* Double poddedness
Colour of Foliage . . . Pale *v.* Dark

if not actually simple ones, can all be bred into varieties, and this of course explains why there are so many varieties in commerce. Very few varieties, however, combine many of the most desired characters, and so plant breeders are continually at work endeavouring to raise strains which are still nearer the ideal.

Fig. 78 shows how the work of cross pollination is carried out



FIG. 76.—WILD KALE OR CABBAGE—THE ANCESTOR OF THE CULTIVATED BRASSICAS.
[To face p. 248.]

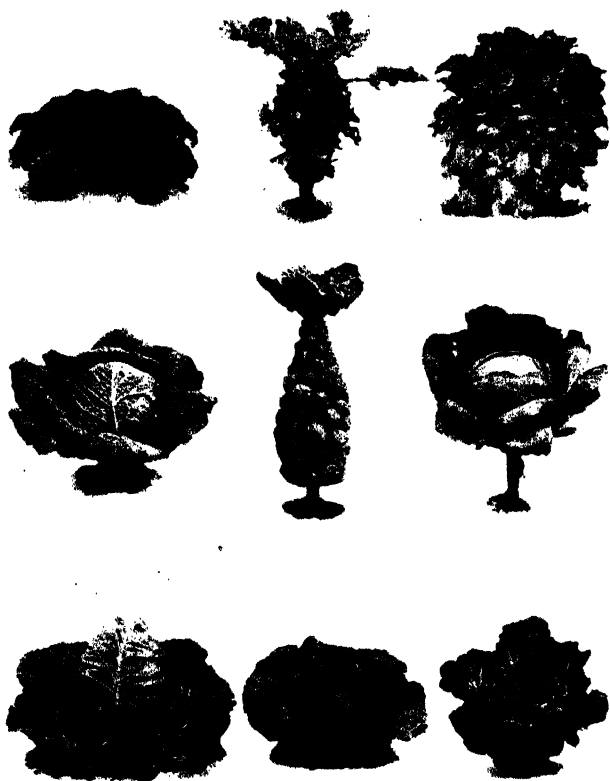


FIG. 77.—TYPES OF PLANTS DEVELOPED FROM THE WILD *BRASSICA OLERACEA*.



FIG. 78.—CROSS-POLLINATING BRASSICAS.

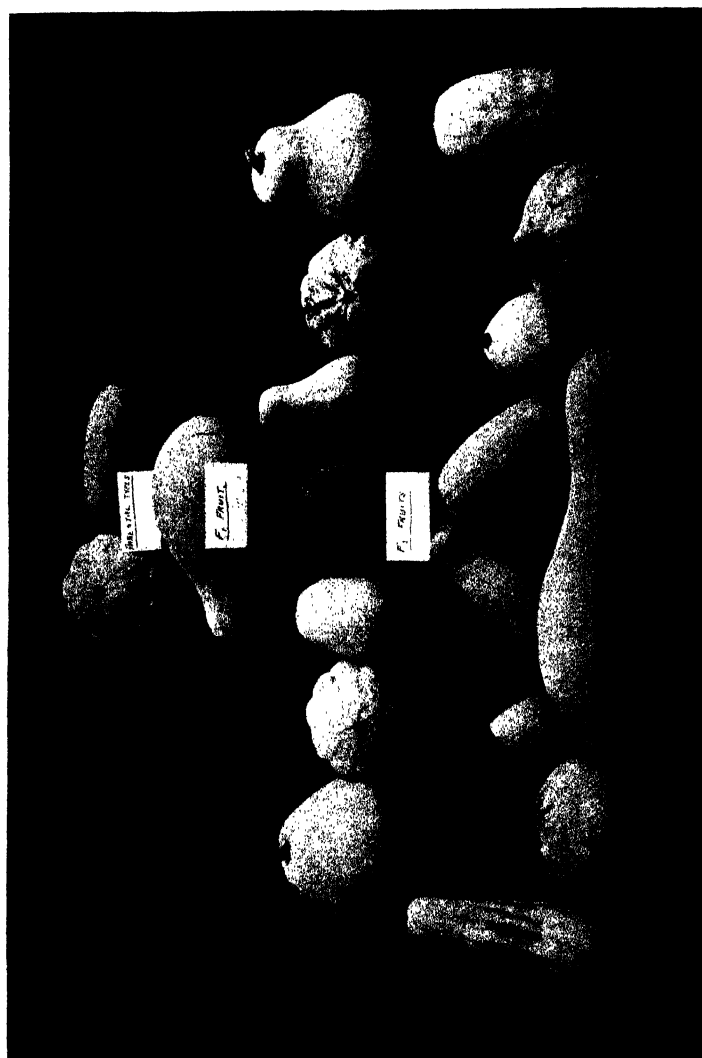


FIG. 79.—TYPES OF VEGETABLE MARROW RAISED BY CROSSING THE PARENTAL TYPES SHOWN AT THE APEX OF THE PLATE.

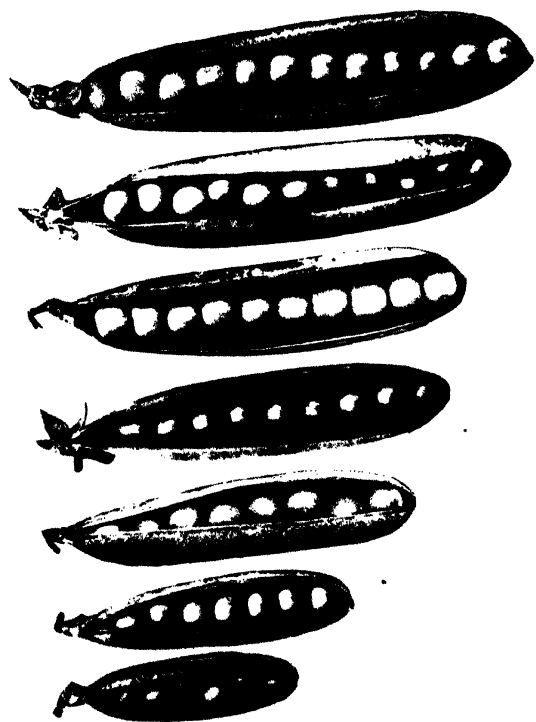


FIG. 80.—TYPES OF GARDEN PEA SHOWING PROGRESSIVE DEVELOPMENT.



FIG. 81.—SELECTION OF CABBAGES FOR SEED IN THE FIELD.



FIG. 82.—CYCLAMEN GROWING FOR SEED.

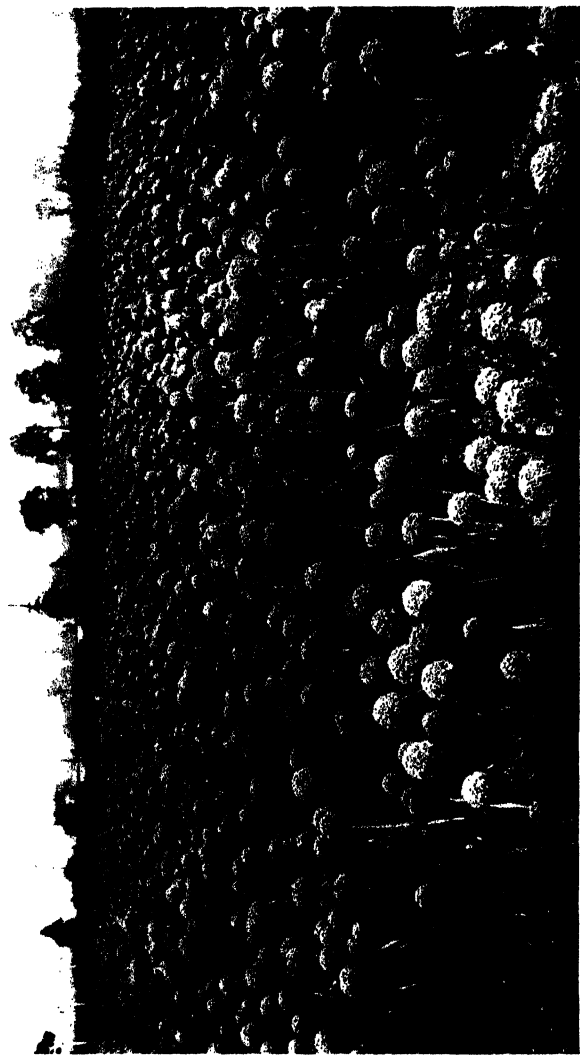


FIG. 83.—A FIELD OF ONIONS GROWING FOR SEED.



FIG. 84.—A FIELD OF CAULIFLOWERS GROWING FOR SEED IN ITALY.



FIG 85 ---HARVESTING OF SEED IN THE FIELD.

[To face p. 249.

with Brassicas, and around will be seen the covers put over the plants to protect them from the pollen of other plants.

Fig. 79 shows the result of crossing two distinct types of Marrows. The two parental forms are shown at the top, the next lower fruit is the hybrid, and all the fruits on the lower two rows have been produced by the hybrid. How many will be of any use commercially remains to be seen. You will see that green colour has appeared as a result of crossing two apparently white fruited kinds. Apparently the factor for colour was dormant in one or other parent, and the cross has developed it.

Similar things happen when two distinct types of Dwarf French Beans are crossed, and many variations in coat colour will come from that cross. As a result of such a cross, in addition to being distinct in the seed, some had other good qualities, such as cropping powers, length of pod, earliness of maturity, and a few of these are being grown on for commercial purposes.

Some plants such as Clovers are very difficult to pollinate by hand, and so an interesting experiment was carried out. Some humble-bees, which had been put into a test-tube, were washed to remove all pollen from them. The bees were then put under tumblers out in the sun to dry before being put to work. They were then put into calico-covered cages in which were growing plants of Clover from which it was desired to get pure seed. The experiment answered very well.

But whilst distinct characters in any given family of plants are generally only found as sports or mutations (such mutations or sports as are known to most of you, being the dwarf or Cupid type of Sweet Pea, the waved bloom of the Spencer types of Sweet Peas, Yellow-fruited Tomatos, White-fruited Cucumbers) and cannot as yet be produced artificially, yet when they have once been produced by nature in a family, they can with the aid of Mendelism be intelligently bred into other forms of the same family, and this gives the foundation upon which to work.

But the extent to which the good characters of plants are developed is a matter of intelligent selection, and it is this continued and careful selection which makes all the difference in the money value or the beauty of the different strains of seeds in commerce. For instance, nothing but careful continued selection would have increased the size of the pod of the Pea. In fig. 80 the smallest open pod has six seeds, the largest has twelve seeds, but it has taken many years to raise the Pea from a 6-seeded pod to a 12-seeded pod. And even when the latter has been attained, it is not a permanent character and must be reselected year after year to retain it.

A plant of the Wild Pea which grows in Palestine at the present time is the supposed origin of all the Garden Peas. It is very slender in habit of growth, and the pods are never more than 1 to 2 inches in length, and it is interesting to compare the pods of the different varieties raised during the past fifty years or so with the giant of to-day, of which the largest pod (the V.C.) measured 8 inches. What

Pods of Peas will be like in another fifty years if improvement is as rapid as in the past, I do not know.

In showing you pictures of plant-breeding work, or in other words "the *means* by which the seedsman obtains new Varieties," I have purposely used Vegetable subjects, because with ordinary lantern slides the points I wished to illustrate could be more easily seen and appreciated in these subjects than in Flowers.

To illustrate the same progress in raising new Sweet Peas, Primulas, Antirrhinums, or any other Flowers, coloured pictures would have been necessary, as ordinary photographs could not under any condition convey an adequate idea of what has been accomplished. The method of procedure in crossing and selecting, however, is much the same in each case.

Having now given you a short account of how new varieties are raised, we will follow some of these on their journey until they become well-known and popular varieties of the day.

We will assume that one of these highly bred varieties of Peas has been cultivated and carefully selected for three or four years in small plots in the Gardens or Trial Grounds, until sufficient seed has been obtained to sow a good-sized field with it.

The land having been got ready, the seed is duly sown, and when the crop is at its best in full pod, men who are expert at the work go systematically up and down all the rows, examining every plant and taking out any which are untrue, or which appear to be inferior. You may wonder why in a highly bred strain of Peas (or anything else) there should be any untrue or impure plants to come out. But it is well known that all plants which are grown from seed have a tendency to degenerate, some more so than others, and unless those plants which have commenced to degenerate are taken out before they produce seed the stock would soon become an inferior one. Then with Peas there is also the chance of birds bringing seeds from a neighbouring farmer's field of agricultural Peas, and depositing them in a field of culinary Peas, and they can of course only be detected when they are in growth. Hence all this necessity of keeping things pure.

When the Peas are ripe enough, the plants are cut and put into little heaps to dry on the field. Some years when the summer is wet it is a very anxious time in harvesting Peas, for before they get dry enough to cart and stack it may rain again, and the longer they stay in the wet the more discoloured the seeds become, and the germination becomes affected. Eventually they are put into ricks, large or small, according to the quantities, and there they remain for the wind to harden the seeds.

The work of seed production is very very interesting. No two seasons are ever alike. What can be done one year often cannot the next. We are always dealing with the uncertainties of the weather, and in working with nature the unexpected often happens.

Fig. 81 shows a field of Cabbages growing for seed. When they are all at their best, as the picture shows, the crop is carefully gone over,

and every one which appears to differ in any way is removed. Some may be too flat in the heart, or have too much leaf and no heart, or there may be signs of crossing in a previous generation. You will see that the inspector has a bundle of sticks under his arm. When he finds a plant which appears to be even more perfect than the others he places a stick against it, and plants so marked are saved separately for "Mother seed" to be sown for future crops. These Brassica crops are most difficult to keep pure, for every variety, of which there are hundreds of Cabbage, Savoy, Kale, Brussels Sprouts, etc., must be seeded a very considerable distance from any other of the same family, as otherwise cross pollination takes place by the agency of insects, or even the wind carrying pollen across the fields from one crop to another.

Flower seeds need quite as much care as Vegetable Seeds in their production. In a house of Primulas or Gloxinias or Cyclamen (fig. 82) being grown for seed thousands of blooms will be pollinated by hand to produce seed.

Amongst all plants some are sure to be found which vary in one respect or another, and the expert is always on the look out for anything which appears to be better than the remainder. When such plants are found they are duly marked, and the seeds are saved separately in order to see if the improved character can be perpetuated.

Sweet Peas require very careful attention to keep them up to the standard. The number of varieties is very large, necessitating the growing of large acreages for seed. Pansies again illustrate the difference there is between the fine blooms of to-day as with those of a few years ago.

In growing Onions for seed, bulbs such as are used for cooking purposes are produced by seed, and these bulbs when carefully selected and made true to type are planted in large fields. At the time of flowering they appear as in fig. 83, and when ripe the heads are cut off and dried. As with the Onions, the heads of Carrots are cut when the seeds are ripe, and put to dry. So with Beet. The three latter crops referred to—Carrots, Beets, and Onions—are biennials, and produce their seed the year following the sowing of the seed.

Whilst the greater portion of seeds can be grown in this country, there are some things which it is impossible to grow commercially in England. One of these is the Cauliflower, for whilst it will produce heads to perfection in these Islands, it is not hardy enough to go through the winter to produce seed the following year. Most of the giant autumn types do best on the shores of the Mediterranean or Adriatic Seas, and here you will see Cauliflowers in a seeding stage under the shadow of Vesuvius (fig. 84). The mountain can be seen in the background. It has fallen to my lot for many years to visit annually the seed crops of our firm in this and other foreign countries, as nothing short of personal visits to make the crops perfectly pure and regular are of any value. Much time has to be spent in all these crops, every head must be examined and all inferior ones removed, and sticks are

placed against some of the best in order that the produce may be saved separately and used as "Mother seed" for another crop. Other types of Cauliflower are grown in Northern Europe.

The harvesting of seeds is done in various ways. The seeds of the choice flowers of the greenhouses are all carefully picked off by hand, and then according to the quantities are put into little trays or bags to dry. Small lots of outdoor grown Flower and Vegetable Seeds are cut and laid out on large cloths until dry enough to thresh out.

Turnip seed is cut, and if the weather is hot and dry it can be threshed out in the field on large cloths at the time of harvesting, as in fig. 85. If the weather is too damp the seed must be put in stacks until dry enough.

Grass and Clover seeds are either cut by hand or by machine, according to the area to be harvested. Then all the large ricks are threshed with an engine and thresher. The seeds coming from the threshing machine contain all sorts of rubbish, stones, sticks and weed seeds. They then have to go through various cleaning machines for taking out all impurities, each machine doing some special work or taking out some kind of impurity.

After the Peas have been through all the machines, they are as perfect as machines can make them, but no machine will remove seeds which have the skins discoloured by continual wet at harvest time. Therefore all the Peas have to be put on benches for women to pick them over, and this makes work for a large number in the winter time.

After the seeds have all been grown, harvested, cleaned, and put into sacks, one thing remains to be done before they can be sold, and that is to test the germination. Obviously it is useless to sell seeds which do not grow, and so they have to be tested in the Laboratory.

All seeds are counted and records of germination kept daily. Purity has also to be ascertained.

In order to keep his knowledge up to date, and also to know what progress he is making, the up-to-date seedsman is obliged to have a Trial Ground, in which are sown samples of all the seeds he has grown or obtained from growers. Then during the growing season varieties can be compared with each other, and new types tried against old to see in what way they are better. With the larger seed houses these trial grounds are very extensive, and in our own the trial rows of Sweet Peas number some 1,200 per year, whilst Asters number 2,000 trial rows. Garden Peas are well over 1,000 rows, and Tomatos over 300.

When the seeds have all passed the technical departments of production and testing, they are handed over to the commercial departments, and put up into packets of various sizes to suit the requirements of customers.

THE YEW IN ENGLAND.

By the Hon. VICARY GIBBS, V.M.H.

I. THE MENTION OF TREES IN DOMESDAY.

IN two places in the article on "Taxaceae at Aldenham and Kew," which appeared in our JOURNAL, 51, p. 189, I have been led into implying, if not actually stating, an error which a little more consideration would have enabled me to avoid. "*Silvae*" appears in Domesday as suitable subjects for taxation, but no single trees are mentioned. The following additions and corrections should therefore be made in that article. On p. 192, in the second paragraph, headed *Duration of Life*, after "record," in line 12, add this footnote:—

"It must be noted, however, that it is a delusion, though a wide-spread one, to suppose that any individual trees are mentioned in Domesday. Indeed they would be most unlikely to find place in a Survey conducted solely with a view to assessment for taxation."

On p. 195, line 13, there should follow "popularly"—

"but quite erroneously, believed to be mentioned in Domesday, and if that were true would have been at the time of removal well over 900 years old; at any rate removal was carried out without its health being injuriously affected."

2. THE SEX OF FASTIGIATE YEWES.

On p. 203, following most if not all other writers on Yews, I stated that *all* Irish Yews have been developed from the Florence Court one, and that it and consequently its offsprings are female.

Since I made the above rash, and, as it now appears, inaccurate, general statement, Mr. FLETCHER of Aldwich Manor, Sussex, has informed me that in the Vicarage garden at Bognor he found lately several fastigate Yews covered with male flowers which sent forth showers of pollen when struck by his stick. In the face of this unimpeachable evidence, it seems clear that though the bulk of Irish Yews may spring from the female plant at Florence Court, yet somewhere and somewhen a male must (as indeed seems *prima facie* not unlikely) have developed the same narrow upright growth, and its progeny is also to be found occasionally.

THE AWARD OF GARDEN MERIT—X.*

By F. J. CHITTENDEN, F.L.S., V.M.H.

64. HYDRANGEA PETIOLARIS.

Award of Garden Merit, June 30, 1924.

Hydrangea petiolaris (or *H. scandens*, as it is sometimes called) climbs like the Ivy. Walls, trees, and rocks are equally suitable for its support; old stumps or roots may give it aid while young and it will grow into a rounded bush form in time. It can then effectively display its handsome flat corymbs of white flowers often 8 inches across in June. The outer flowers of the corymb are sterile and have four to six flat expanded sepals; the inner are small and fertile. No special soil is needed for it, nor is it tender (except to late spring frosts which may nip its earlier growths, as indeed they may those of the English oak!). It is figured in the *Bot. Mag.*, t. 6788.

65. COTONEASTER FRIGIDA.

Award of Garden Merit, November 2, 1925.

The genus *Cotoneaster* is a remarkable one in the diversity of habit existing between the species which constitute it. We have already referred to the spreading dwarf *Cotoneaster horizontalis*, and there are still more prostrate species both with deciduous and evergreen foliage. The species are all natives of the temperate regions of the Old World, and the headquarters of the genus is in the Chino-Himalayan region, *C. frigida* being found in the Himalaya and introduced to British gardens about a hundred years ago. It will grow anywhere and forms a large shrub or small tree according to its early treatment. Its leaves are deep dull green and its flowers white. The corymbs are about 2 inches across and are produced in great numbers, so that the tree is a striking object at the latter end of May but even more striking in winter with its enormous crop of bright scarlet berries about as big as peas. Fortunately these fruits are usually (but not always) left untouched by birds and may hang until February. It is worth while to spray with quassia and soft soap now or then or with paraffin emulsion, to prevent attack, if birds begin to feed upon them, so as to preserve them for the duller months. It has been well figured in the *Bot. Reg.*, t. 1229. There is a yellow fruited form growing at Wisley, less worthy of a place in the garden, however, than the type.

* For earlier annotated lists of Awards of Garden Merit and the grounds upon which the Award is given, see vols. 47, p. 189; 48, pp. 58 and 223; 48, p. 233; 50, pp. 100 and 260; 51, pp. 84 and 337; and 52, p. 82.

66. *LITHOSPERMUM PROSTRATUM* 'HEAVENLY BLUE.'

Award of Garden Merit, December 8, 1925.

Lithospermum prostratum is a sub-shrubby evergreen plant from the Pyrenees, and proper for the front of a border in sandy soil, well drained but not too dry, or for a flat rock down the face of which it may hang, always in full sun, and always free from lime. It does not thrive in soil too rich. Like most plants it varies somewhat in the colour of its flowers, which are normally blue, but the form to which the name 'Heavenly Blue' has been given is a brighter, cleaner blue than the type and there is a white form which Mr. SIDNEY MORRIS brought to England and which looks well as scattered plants among its blue-flowered parents. Recently, too, a pink form has been sent to us, collected in its wild habitat. The main flowering time is May and June, and then the plants are so covered that a good patch lies a beautiful blue mat among the green and greys and whites and yellows of its companions in the rock garden or the dry wall, and earns, as it merits, the encomiums of everyone who sees it.

It does not come true from seed, but may be readily raised from cuttings of half ripe shoots put into a sandy compost in a close frame in July. Where the variety had its origin is not clear, but it seems first to have attracted notice in that garden of excellent plants which belonged to Dr. W. H. LOWE, at one time of Balgreen, Edinburgh, and then of Woodcote, Wimbledon, who gave it to Mr. BOWLES, in whose garden at Myddelton House it was known as Dr. Lowe's variety. Thence Mr. AMOS PERRY, the nurseryman of Enfield, had it, and propagated it and introduced it to the general public under the name of *Lithospermum prostratum* 'Heavenly Blue.' The attractive varietal name has become so intimately connected with this striking plant that the unlearned often use it alone to designate the plant when they wish to refer to it, and so greatly to be desired is it that not seldom it has to be purchased to replace its forerunners that have died through being planted in unsuitable places.

67. *PYRUS SARGENTII*.

Award of Garden Merit, May 9, 1927.

This is another crab of excellent beauty in flower, but not yet well known in English gardens. This is perhaps best planted on a bank where its low, broad growth, making a mound of blossom in early May, can be seen to advantage. The flowers are broad-petalled, saucer-shaped, pure white and profusely borne in umbels all over the bush, from the lowest branches hugging the ground to the top of the broad head, five or six feet high. It is a native of Hokkaido, the northernmost island of Japan, and perfectly hardy in this country. Its nearest relatives appear to be *P. Toringo* and *P. Zumi*.

68. PYRUS \times ELEVI.*Award of Garden Merit, November 2, 1925.*

When *Pyrus Niedzwetzkyana* was introduced from south-western Siberia and the Caucasus region, where it is said to be abundant, it gave an opportunity of raising new ornamental crabs which has been used by several now. The first of these to secure a place in gardens was *P. \times purpurea* (A.G.M., see JOURNAL R.H.S., 48, p. 229), but many others have followed, and among them *P. \times Eleyi* stands out alike in flower and fruit. It makes a handsome small tree with flowers larger than in *P. Niedzwetzkyana*, later to open and of an attractive soft-red colour, to be followed by attractive red-purple fruits of the size and colour of Morello cherries, hanging in thick clusters on the lower sides of the branches. The foliage, too, has an attractive purplish tint.

Few plants have attained the distinction of two awards in one year. This is one of the few, for it received A.M. on May 9, 1922, when shown in flower by Mr. ELEY, and later F.C.C. (Oct. 3, 1922), when shown in fruit by Mr. NOTCUTT.

It was raised by Mr. CHAS. ELEY in his garden at East Bergholt by crossing *P. Niedzwetzkyana* and *P. spectabilis*.

69. SAXIFRAGA COTYLEDON PYRAMIDALIS.

Award of Garden Merit, December 8, 1925.

Saxifraga Cotyledon, though it seems to forswear limestone in its native haunts, is not averse from a limy soil in the garden so long as the drainage is good, the situation light and sunny, and the soil moderately rich. It is best accommodated in the higher parts of the rock garden, for its great panicles of white flowers may then show themselves to advantage, bowing beneath their weight of white (generally white) flowers and waving in the breeze. Even though it never flowered the wide rosettes of long grey-green leathery leaves beaded at their edges with limy dots would be worth a place in the garden. Each rosette gives rise to daughter rosettes, and by these it should be propagated, for the rosettes that produce the flower spike die in the effort, and their seed possibly not coming true is slower and needs more care to produce plants. There are many forms, but the most ample and with the broadest pyramids of flower is the variety to which the Award has been given, the var. *pyramidalis*.

70. CYTISUS ALBUS.

Award of Garden Merit, June 7, 1926.

May, June and July may be regarded as the season of the brooms, and than these no more floriferous shrubs exist and none more suited to open sunny places in sandy or stony soils. Speaking generally,

where heaths flourish there also will brooms be at home, but their restrictions are less rigid than those of the heaths, and so long as the soil is not water-logged they may be expected to thrive in almost any soil. *Cytisus albus* is a native of Portugal, a shrub of quick development from seed, beautiful in youth, rather apt to get ungainly in age, but easy to replace—indeed where it is suited it will replace itself quite freely. It attains a height of eight to ten feet and a spread at least as great, and its long slender branches are clothed its full length with white or faintly rose-tinted (var. *rosea*) flowers. It is figured in the *Bot. Mag.* t. 8693, where the flowers are tinted rose.

71. ALSTROEMERIA AURANTIACA.

Award of Garden Merit, July 5, 1926.

Alstroemeria aurantiaca is the most accommodating of a genus of beautiful South American herbaceous perennial plants, with bright and often curiously marked funnel-shaped flowers and stiff stems clothed with dark green leaves each of which is twisted, so that what would normally be the lower surface is turned uppermost. *A. aurantiaca* grows 2 or 3 feet (or even more) in height and bears in summer orange-yellow flowers variously streaked with red in groups of ten or a dozen. Most of the species are best in full sun and some are tender, but this is hardy and will thrive in at least the partial shade of apple trees, as it does at Wisley. Alstroemerias are not easy to move, for they have fleshy storage roots which are rather brittle and should not be broken. They are best established by sowing fresh seed (as soon as it is ripe) four or five in a five-inch pot, and growing them thus without disturbance for a year, then transplanting them to their permanent quarters bodily without disturbance. A deep sandy loam with leaf soil, moist, but not wet, suits them, and once planted they should remain undisturbed, an occasional top dressing of leaf soil being all that is necessary. Do not attempt to prick out the brittle young seedlings, nor to transplant established plants.

72. ARENARIA MONTANA.

Award of Garden Merit, December 8, 1925.

This plant of western and middle France and of Spain, where it grows on wooded slopes and in thickets, is indispensable for the rock garden, though if the garden be a small one the very vigour of the plant may lead to need for some repression. Its ample green (except in the Spanish variety *saxicola*, where they are whitish) mats of foliage are almost hidden in May and June by the large white flowers, each about an inch in diameter, raised just above the leaves. Well-drained loam and a crevice between the rocks suit it admirably. It increases readily by underground growths and can be as readily divided, and this is the best way to increase it, for it does not seed freely. It was figured long ago in the *Bot. Mag.* at t. 1118.

73. *CRINUM POWELLII* ALBUM.*Award of Garden Merit, October 5, 1925.*

As *Colchicum speciosum album* is the best white-flowered bulb flowering in autumn, so *Crinum Powellii album* is the best hardy bulb with white flowers for summer. It is hardy in the south at least, and worth trying anywhere in the British Isles, but it should be planted (preferably in May) fairly deep, about nine inches to the base of the bulb, and where severe frosts occur it may be well to cover with litter for winter. At Wisley it succeeds in moist soil near the ponds (not, however, water-logged in winter) and produces several flowers at the head of stout stems annually in July or August, which often ripen their curious fleshy seeds. These will germinate at once, and while they cannot be depended upon to come true (*C. Powellii* being a hybrid between *C. Moorei* and *C. capense* raised in gardens about thirty-five years ago) they will produce very pleasing plants and are worth while taking trouble over. *C. Powellii* occurs in several shades of pink, but the Award is made to the white form.

74. *ERYTHRONIUM CALIFORNICUM*.*Award of Garden Merit, March 8, 1926.*

As with so many plants, much confusion surrounds the names of the *Erythroniums* of Western America, where they are among the most conspicuous and beautiful of spring flowers in the rocky woods. The present species has richly mottled leaves, from among which in March or April springs a slender stem bearing cream flowers suffused with orange in the middle and often with a maroon band just above the ear-shaped bases of the floral segments. There may be but one of these flowers, but there are usually more, three being common, and as many as sixteen have been counted in a raceme. Like most *Erythroniums*, the floral segments curve back in the open flower, especially in the sun. Another important character by which this species is distinguished from others is in the deeply divided, club-shaped style with its divisions spreading widely in the fully open flower, and in its slender filaments. The flowers have none of the greenish tinge which is seen in *E. giganteum*, the name by which this species was so long known, but which has a different range and is botanically distinct, the figure in tab. 5714 of the *Botanical Magazine* giving a faithful picture of it. *E. californicum* grows in woods on well-drained slopes in light soil and is found only in Northern California in the hills lying about twenty miles back from the coast, not in Oregon, whence *E. giganteum* first came. Both this and *E. giganteum* have been called *E. grandiflorum*. The true *E. grandiflorum* has usually solitary yellow flowers (never more than three on a stem) and unmottled leaves.

75. MUSCARI CONICUM.

Award of Garden Merit, April 12, 1926.

No flower is more effective in the garden if massed in the open or under the light shade of thin deciduous shrubs than the 'heavenly blue' *Muscari conicum*. Nearly all the Muscaris or Grape Hyacinths are worth cultivation, but none is more beautiful than this, and it is quite easily procurable and very cheap. Planted in September or October its bulbs may remain for years, and will steadily increase in any ordinary soil with a sufficiently sunny aspect and good drainage. Botanically the Muscaris are not easy to distinguish, but this is fairly easy to recognize by its numerous close-set flowers in a long spike tapering more or less to the apex, not cylindrical. Its wild habitat is not certainly known and it is generally sold as Muscari 'Heavenly Blue.'

KEY TO THE SPECIES OF MAGNOLIA.

By J. E. DANDY, B.A., F.L.S.

SINCE Mr. MILLAIS published his book "Magnolias" * the author of the key of the genus included there has extended his studies to include the whole family of Magnoliaceae, and in the course of that work certain modifications have been found to be necessary. Numerous type-specimens of species not previously seen have been examined from various herbaria, and it is hoped to present the results of these studies in the form of a comprehensive monograph of the family.

In the meantime, however, it has been decided, with the kind approval of Mr. MILLAIS, to make this key to *Magnolia* available in its modified form to cultivators of this genus, which is rapidly gaining favour in gardens.

KEY.

LEAVES EVERGREEN :

Pistil sessile :

Ripe carpels long-beaked, the beak much longer than the carpel ; flower-stalks closely ringed with annular scars, at first hairy ; leaves obovate-oblong, up to 40 cm. long, very markedly becoming smaller towards the ends of the branchlets ; Nepal to Upper Burma.

1. *pterocarpa*.

Ripe carpels not or shortly beaked ; flower-stalks not closely ringed :

Flower-stalks stout, over 8 cm. long, curved, ringed with distant annular scars ; leaves obovate-oblong, the larger 30-65 cm. long, with a petiole over 3 cm. long ; petals oblong ; Yunnan and Siam.

2. *Henryi*.

Flower-stalks under 8 cm. long ; leaves not as above :

Petioles over 4 cm. long ; leaves ovate or oblong-ovate, rounded at the base, rounded or obtuse at the tip, usually over 15 cm. long and 9 cm. broad, glaucous and more or less hairy beneath ; Yunnan.

3. *Delavayi*.

Petioles under 4 cm. long ; leaves not as above :

Petals ovate or obovate, narrowed at the base (unknown in 6) :

Flowers open, erect, usually over 4 cm. across (unknown in 6) ; petioles mostly over 1 cm. long :

Leaves silvery and pubescent beneath, more or less elliptic ; young lateral shoots growing out with the flowers ; E. N. America.

4. *virginiana*.

* *Magnolias*, by J. G. Millais (Longmans, Green & Co. Ltd.), London, 1927.

Leaves not silvery beneath :

Peduncles densely hairy :

Leaves lustrously silky-hairy beneath, ovate or ovate-elliptic ; carpels glabrous ; Porto Rico. 5. *splendens*.

Leaves glabrous or reddish-hairy beneath ; carpels yellowish-hairy :

Carpels few, about 14 ; leaves obovate, very obtuse or rounded and usually slightly emarginate at the tip, shortly pubescent beneath when young, glabrous at maturity ; Haiti. 6. *domingensis*.

Carpels numerous, more than 20 ; leaves ovate-elliptic, elliptic, or obovate-elliptic, reddish-hairy or sometimes glabrous beneath ; E. N. America. 7. *grandiflora*.

Peduncles glabrous or nearly so :

Petals under 4 cm. long ; carpels 5-6 ; leaves under 9 cm. long, elliptic or ovate-elliptic ; Cuba. 8. *cubensis*.

Petals over 4 cm. long ; carpels about 18-25 ; leaves over 9 cm. long :

Leaves orbicular or almost so, up to 1½ times as long as broad ; Porto Rico. 9. *portoricensis*.

Leaves elliptic, about twice as long as broad :

Peduncles glabrous or slightly grey-pubescent at top ; carpels glabrous ; Mexico. 10. *Schiedeana*.

Peduncles sparingly reddish-pubescent ; carpels reddish-pubescent towards the base ; Guatemala.

11. *guatemalensis*.

Flowers globular, often nodding, under 4 cm. across ; petioles very short, under 1 cm. ; leaves elliptic to oblong, very acute at the base, acuminate at the tip ; sepals green :

Peduncles glabrous, recurved ; carpels glabrous ; stamens up to 7 mm. long ; leaves laxly reticulate ; S.E. China.

12. *coco*.

Peduncles hairy, almost straight ; carpels silky-hairy ; stamens over 8 mm. long ; leaves closely reticulate ; Hongkong.

13. *Championii*.

Petals narrowly oblong or oblanceolate, not exceeding 1½ cm. broad ; petioles very short, under 1 cm. ; leaves narrowly elliptic to narrowly obovate-oblong, acuminate at the tip :

Peduncles, carpels, and flower-buds hairy ; leaves glaucous beneath and hairy on the midrib ; Malay Peninsula and Sarawak. 14. *Maingayi*.

Peduncles, carpels, and flower-buds glabrous ; leaves green beneath and glabrous at maturity :

Leaves over 18 cm. long and 5 cm. broad, pubescent beneath when young ; petioles shortly pubescent ; Java.

15. *javanica*.

Leaves under 18 cm. long and 5 cm. broad, glabrous throughout ; petioles glabrous ; Assam. 16. *Gustavii*.

Pistil shortly stalked :

Peduncles over 3 cm. long ; petals narrowly oblong, less than $1\frac{1}{2}$ cm. broad ; leaves elliptic to obovate-oblong, over 15 cm. long, not very glossy above :

Leaves over 22 cm. long and 10 cm. broad, hairy on the nerves beneath, when young densely silky-hairy beneath ; Assam and Upper Burma. 17. *Griffithii*.

Leaves under 22 cm. long and 10 cm. broad, when young puberulous beneath ; Assam. 18. *Pealiana*.

Peduncles under 1 cm. long ; petals narrowed to the base, up to 2 cm. broad ; leaves oblong or ovate-oblong, under 12 cm. long, very glossy above, glabrous ; S.E. Tibet, Upper Burma, and Yunnan. 19. *niliad*.

LEAVES DECIDUOUS :

Flowers appearing with or after the leaves :

Leaves auriculate or deeply cordate at the base, broadest above the middle :

Leaf-buds hairy ; leaves silvery beneath, over 30 cm. long :

Ripe carpels not beaked ; petals with a purplish spot within the base ; E. N. America. 20. *macrophylla*.

Ripe carpels beaked ; petals unspotted ; Mexico. 21. *dealbata*.

Leaf-buds glabrous ; leaves pale green or subglaucous beneath, usually under 30 cm. long ; E. N. America :

Leaves fiddle-shaped, broadest about $\frac{1}{3}$ of their length from the tip, very abruptly contracted to an acute tip. 22. *pyramidata*.

Leaves elongate-obovate, broadest $\frac{2}{3}$ — $\frac{1}{2}$ of their length from the tip, gradually acute. 23. *Fraseri*.

Leaves acute to rounded or subcordate at the base :

Leaves obovate or elongate-obovate, attenuate towards the base, mostly over 30 cm. long, with more than 20 pairs of lateral nerves :

Fruit up to 10 cm. long, the carpels with spreading beaks ; leaves pale green or subglaucous beneath ; flowers with a disagreeable odour ; sepals pale green ; E. N. America. 24. *tripetala*.

Fruit over 10 cm. long ; leaves glaucous and more or less hairy beneath ; flowers fragrant :

Ripe carpels long-beaked, the beak incurved and over 6 mm. long ; leaves reddish-hairy on the midrib and nerves beneath ; S.E. Tibet, Upper Burma, and Yunnan. 25. *rostrata*.

Ripe carpels shortly beaked, the beak up to 3 mm. long ; leaves pale-hairy on the midrib and nerves beneath :

Petioles purplish ; branchlets purplish when dry ; fruit cylindrical, somewhat pointed at the tip and attenuate at the base ; Japan. 26. *obovata*.

Petioles green ; branchlets yellowish when dry ; fruit oblong-ovoid, truncate at the tip and rounded at the base ; leaves sometimes 2-lobed at the tip (var. *biloba*) ; China.

27. *officinalis*.

Leaves ovate, ovate-elliptic, obovate, or almost orbicular, under 30 cm. long, with fewer than 20 pairs of lateral nerves :

Flowers yellow or yellowish-green ; leaves ovate to obovate, narrowed to an acuminate tip, usually over 15 cm. long and 10 cm. broad ; E. N. America.

28. *acuminata*.

Flowers white or creamy-white, sometimes pink or purple outside : Leaves silvery and pubescent beneath, more or less elliptic ; young lateral shoots growing out with the flowers ; E. N. America.

4. *virginiana*.

Leaves green or rarely subglaucous beneath :

Peduncles very short, under 1 cm. ; flowers purple outside ; leaves obovate, very acute at the base, abruptly narrowed to an acuminate tip ; China.

42. *liliflora*.

Peduncles mostly well over 1 cm. long ; flowers white or pink outside ; leaves obtuse or rounded at the base :

Leaves broadest below or at the middle, ovate, ovate-elliptic, or oblong, acute at the tip :

Leaves small, not exceeding 6 cm. broad and 15 cm. long, more or less hairy beneath ; Szechuan and Yunnan.

29. *Wilsonii*.*

Leaves large, over 8 cm. broad and usually over 15 cm. long, reddish- or tawny-hairy beneath ; E. Himalaya.

30. *globosa*.

Leaves broadest above the middle, broadly oblong-obovate to almost orbicular :

Petals 6 or more cm. long ; leaves usually over 15 cm. long and 10 cm. broad ; Szechuan.

31. *sinensis*.†

Petals under 5½ cm. long ; leaves up to 15 cm. long and 10 cm. broad ; Korea and Japan.

32. *parviflora*.

Flowers appearing before the leaves :

Sepals subequalling and resembling the petals :

Leaves elliptic to oblong-obovate, usually rounded at the base, over 15 cm. long, with more than 12 pairs of lateral nerves :

Petioles and under-surface of leaves shortly and softly spreading-hairy ; S.E. Tibet, Upper Burma, and Yunnan.

33. *mollicomata*.

Petioles glabrous or almost so ; under-surface of leaves glabrous or silky-hairy ; Nepal to Assam.

34. *Campbellii*.

* Study of numerous specimens from Northern Yunnan shows that *M. Nicholsoniana* can no longer be retained as distinct from *M. Wilsonii*, the density of the indumentum of the leaves being a very variable character in this species.

† Dr. Stapf has elevated *M. globosa* var. *sinensis* to specific rank as *M. sinensis*.

Leaves broadest well above the middle, mostly under 15 cm. long, with not more than 12 pairs of lateral nerves :

Sepals and petals 12 or more, narrowly linear-oblong, up to 1½ cm. broad ; leaves usually under 8 cm. long and 4 cm. broad, narrowly obovate, very acute at the base, glabrous ; Japan.

41. *stellata*.

Sepals and petals 9 or more, over 2 cm. broad ; leaves over 8 cm. long and 4 cm. broad, obovate to oblong-obovate :

Leaves usually rounded and often emarginate at the tip ; sepals and petals 12 or more :

Leaves leathery, shining and conspicuously reticulate above ; Szechuan.

35. *Dawsoniana*.

Leaves not leathery, usually dull and not conspicuously reticulate above ; Szechuan and Yunnan.

36. *Sargentiana*.

Leaves abruptly acuminate at the tip ; China :

Sepals and petals 9, tapering downwards to a broadish base ; flowers cup-shaped, white.

37. *denudata*.

Sepals and petals 12 or more, much narrowed at the base ; flowers saucer-shaped.

38. *Sprengeri*.*

Sepals 3, much smaller than and distinct from the petals :

Filament much shorter than the anther :

Leaves broadest below or about the middle, lanceolate to elliptic, tapering gradually towards the tip :

Leaf-buds silky-hairy, shining ; leaves pale green beneath ; C. China.

39. *aulacosperma*.

Leaf-buds glabrous ; leaves more or less glaucous beneath ; Japan.

40. *salicifolia*.

Leaves broadest well above the middle, narrowly obovate to oblong-obovate :

Petals 9-18, narrowly linear-oblong, up to 1½ cm. broad ; leaves usually under 8 cm. long and 4 cm. broad, narrowly obovate ; Japan.

41. *stellata*.

Petals 6-9, obovate to spatulate, over 1½ cm. broad ; leaves over 8 cm. long and 4 cm. broad, obovate to oblong-obovate :

Flowers purple outside ; petals usually over 6 cm. long ; China.

42. *liliflora*.

Flowers white ; petals usually under 6 cm. long ; Korea and Japan.

43. *kobus*.

Filament subequal to the anther ; Hupeh.

44. *Biondii*.

* Examination of the type-specimen shows that *M. Sprengeri* is the same as *M. diva* (including *M. denudata* vars. *purpurascens* and *elongata*), and the former as the older name takes precedence.



FIG. 86.—CELERIAC 'SNOWBALL.'
A variety with clean, shapely roots and small tops.

[To face p. 264.



FIG. 87.—CELERIAC 'GIANT PRAGUE.'
A variety with thongy roots and large foliage.

THE TESTING OF NEW VARIETIES OF FRUIT TREES FOR COMMERCIAL PURPOSES.

TRIALS of new varieties of fruit trees were undertaken by the Royal Horticultural Society jointly with the Ministry of Agriculture in 1923 to aid the market fruit grower in the selection of new varieties for commercial purposes, and to provide growers with reliable information, not hitherto available, as to the characteristics of the newer varieties. This it is hoped will assist them in the selection of varieties for planting, and will, moreover, assure official recognition and wide publicity to really good varieties.

The conduct of the trials is in the hands of a Joint Committee of representatives of the Ministry of Agriculture and the Royal Horticultural Society. The gardens of the Society at Wisley, Surrey, serve as the Central Station where all varieties entered for the scheme are grown and tested in the first instance. Those varieties which show sufficient merit at the Central Station are to be sent for further tests to sub-stations situated in fruit-growing districts throughout the country. Arrangements have already been made to establish sub-stations at Perdiswell (Worcestershire), Long Ashton (Somerset), Merton (Surrey), Osgodby (Yorkshire), Wisbech (Isle of Ely) (bush fruit only), Emneth (Norfolk), Saltash (Cornwall), East Malling (Kent), and Cambridge, and another is contemplated in the North of England.

The scheme embraces both top and bush fruits and nuts. Raisers whose varieties after inspection of the fruit promise to be useful for market purposes are asked to send sufficient plants, buds or grafts to allow the following number of trees, bushes or plants of each variety to be grown :

Apples and Pears	20 half standards plus 20 bushes.
Plums, Cherries	20 half standards
Nuts	20 bushes.
Currants, Gooseberries, Raspberries and other berries	20 bushes or canes.
Strawberries	100 plants.

The buds or grafts are "worked" on approved stocks before being planted. A nursery for the propagation of the stocks, trees and bushes is maintained at the Central Station. In no circumstances will the Central Station or any sub-station permit plants, buds or grafts to be taken off the stations. After consideration of the reports of the recording staff and of selected specialists, the Committee will issue reports in which recommendations of special varieties will be made. No report on a variety will, however, be issued until sufficient time has elapsed to enable a fair test to be carried out.

A collection of standard varieties of fruit is maintained at the Central Station and is available for comparison of the characteristics of the varieties under trial. This collection comprises at present the following numbers of varieties or supposed varieties :

Apples	340
Pears	145
Plums and Damsons	65
Gooseberries	165
Red Currants	39
White Currants	5
Black Currants	51
Raspberries	141
Other berries	17
Strawberries	10
Quince	6
Cherries	8
Nuts	9

At the present time (April 1927) the trial and nursery grounds cover an area of over 17½ acres, and the numbers of varieties under trial are as follows :

Apples	72
Pears	8
Plums	13
Damsons	2
Cherries	6
Red Currants	14
Black Currants	37
White Currants	2
Gooseberries	14
Raspberries	30
Strawberries	5
Other berries	4
Nuts	1

The trees and plants established in the trial grounds at the Central Station have made satisfactory growth, and those that have reached bearing age have cropped well. In particular certain Red and Black Currants and Raspberries are giving interesting results, their crops being well above commercial average in quality and apparently also in weight. Several varieties of Apples show promise of some commercial value.

Certain varieties have already shown sufficient merit at the Central Station to warrant further tests. In the autumn of 1925 the Committee selected the following varieties of Black Currants and Raspberries for distribution to sub-stations.

Black Currants.

‘ Baldwin ’	} Standard varieties for comparison ;
‘ Seabrook’s Black ’	
‘ Goliath ’	
‘ Boskoop Giant ’	

and the following new introductions :

- ‘ Westwick A ’ (Col. Petre, Westwick, Norwich) ;
- ‘ Davison’s Eight ’ (Col. Petre, Westwick, Norwich) ;
- ‘ September Black ’ (Messrs. Daniels, Norwich) ;
- ‘ Blacksmith ’ (Messrs. Laxton, Bedford) ;
- ‘ Taylor 71/23 ’ (G. Taylor, Portobello, Midlothian).

Raspberries.

‘ Baumforth’s Seedling A ’	} Standard varieties for comparison ;
‘ Baumforth’s Seedling B ’	
‘ Pyne’s Royal ’	
‘ Lloyd George ’	
‘ Devon ’	

and the following new introductions :

- ‘ Bountiful ’ (Messrs. Laxton) ;
- ‘ Red Cross ’ (G. Pyne, Topsham, Devon).

Twenty bushes or canes of each variety were sent to the sub-stations at Osgodby, Perdiswell, Merton, and Long Ashton, and a year later to the more recently established sub-stations at Wisbech, Emneth, and Saltash. Reports received subsequently indicate that the stocks made satisfactory growth at the four first-named places during 1926.

In two other varieties of Black Currants and four varieties of Red Currants were selected for further tests at the same sub-stations. The varieties in question were :

Black Currants.

New introductions :

- ‘ Westwick C ’ (Col. Petre) ;
- ‘ Mite Free ’ (Messrs. Laxton).

Red Currants.

‘ Perfection ’	} Standard varieties for comparison ;
‘ Fay’s Prolific ’	
‘ Wilson’s Long Bunch ’	

and the following new introduction :

- ‘ Laxton’s No. 1 ’ (Messrs. Laxton).

One Apple, ‘ Laxton’s Superb,’ is considered by the Committee to have reached the stage for further tests, and 40 trees of this variety will be sent next autumn to each sub-station.

The Committee also decided to test at sub-stations 10 new varieties of Canadian Apples now growing at the Central Station, and one tree of each variety on each of three different root-stocks was sent last autumn to each of the sub-stations at Osgodby, Perdiswell, Merton, Long Ashton, Saltash, and Emneth. These trees will provide a preliminary test to secure early evidence of the suitability of varieties for extended trials with the full complement of 40 trees of each.

No Gooseberries have yet been selected for distribution to sub-stations, but many varieties cropped well during 1926, and it is anticipated that some varieties will be selected for distribution this year. No Pear or Plum has yet commenced to crop sufficiently well to afford an indication of its true commercial value.

In addition to these trials, experiments are in progress to establish the number required in any given experiment to cover experimental error and other experimental risks. Arrangements are therefore being made to provide 100 bushes of each of 4 varieties of Black Currants by the Central Station to the three Horticultural Research Stations at Long Ashton, East Malling, and Cambridge, where crop records from individual bushes might be kept over a period of years.

ANNUALS AT WISLEY, 1926.

FROM time to time some of the larger groups of Annuals have come into the Calendar for trial at Wisley, but the smaller ones have been passed over. The Council therefore determined to invite seedsmen to send stocks of their seeds of fourteen of the smaller groups for trial during 1926, viz. *Acroclinium*, *Calandrinia*, *Cosmos*, *Helichrysum*, *Lavatera*, *Linum*, *Nemesia*, *Nemophila*, *Nigella*, *Portulaca*, *Rhodanthe*, *Statice*, *Sweet Sultan*, and *Viscaria*.

Seeds were received and dealt with as mentioned at the head of each section, and satisfactory stands were obtained of all except *Sweet Sultan* and *Nigella*, neither of which developed in such a way as to permit of judgment being passed.

The Floral Committee examined the trials on three occasions, and made recommendations for awards as is set out below.

The plants were grown on ground hitherto occupied by vegetables, and on the whole they made good growth, and in some cases would have well occupied more than the space allotted to them.

CALANDRINIA.

Nine stocks of *Calandrinia* were received. The seed was sown, partly in the open where the plants were to flower and partly under glass, on April 17, 1926, those raised under glass being planted out on June 3, 1926, in rows 8 inches apart, 6 inches between the plants. There was no difference in size of plant or time of flowering between the two lots of plants.

Calandrinias are natives of America, *C. grandiflora* coming from Chile, *C. umbellata* from Peru, and *C. speciosa* (*Menziesii*) from California. They like a hot situation and expand their flowers only in bright sun.

DESCRIPTIONS AND NOTES.

1. *Flowers amaranth.*

GRANDIFLORA (Watkins & Simpson, Barr, Dobbie).—Height 2 feet; flowers $1\frac{1}{2}$ inch diameter, single, bright rosy-amaranth, borne in clusters of 6 to 10. Flowering from July 21.

2. *Flowers magenta.*

UMBELLATA (Watkins & Simpson, R. Veitch, Herb).—Height 9 inches; flowers $\frac{3}{4}$ inch diameter, single, bright magenta, borne in umbels of 10 to 20. Flowering from July 21.

3. *Flowers purplish-carmine.*

SPECIOSA (Watkins & Simpson, Barr, R. Veitch).—Height 12 inches; flowers $\frac{3}{4}$ to $\frac{1}{2}$ inch diameter, single, purplish-carmine; borne in clusters of 14. Flowering from June 18.

PORTULACA.

Sixteen stocks of *Portulaca* were received. Seed sown on April 29 in the open failed to produce flowering plants. Sown under glass on the same date, and planted out on June 9 in rows 12 inches apart, with 6 inches between the rows, the plants grew well and flowered profusely. Like the *Calandrinias* the flowers open only in sunny weather, but their brilliant colours and prostrate growth make them well worth a place in the sunny garden, especially where the soil is light. In some places the plants sow themselves, but this is true as a rule only in districts with hot summers.

All the varieties sent in belonged to the species *Portulaca grandiflora*, a native of Brazil, whence it was introduced just a hundred years ago.

AWARDS, DESCRIPTIONS AND NOTES.

A. Flowers double.

1. Flowers orange.

AWARD.

Aurea, H.C. August 12, 1926. Sent by Messrs. Dawkins of King's Road, Chelsea.

AUREA (Dawkins), H.C.—Height 4 inches; of prostrate habit; flowers $1\frac{1}{2}$ inch diameter, double, bright yellowish-orange. Flowering from July 12. Contained magenta and white rogues.

2. Flowers pale salmon.

SALMONEA (Dawkins).—Height 4 to 5 inches; flowers semi-double, $1\frac{1}{2}$ inch diameter, pale salmon-buff. Flowering from July 12. Contained white, magenta, yellow and single-flowered plants.

3. Flowers rosy-scarlet.

AWARD.

Thellusoni, H.C. August 12, 1926. Sent by Messrs. Dawkins.

THELLUSONI (Dawkins), H.C.—Height 4 inches; flowers double, $1\frac{1}{4}$ to $1\frac{1}{2}$ inch diameter, bright rich rosy-scarlet. Flowering from July 12.

4. Flowers of various colours.

GRANDIFLORA FLORE PLENO MIXED (Herb).—Flowers $1\frac{1}{4}$ to $1\frac{1}{2}$ inch diameter, white, pink, yellow and magenta. Many single.

GRANDIFLORA DOUBLE (Dobbie).—Flowers $1\frac{1}{4}$ inch diameter, yellow, pink, scarlet and magenta. Many single.

DOUBLE MIXED (Barr, R. Veitch).—Flowers $1\frac{1}{4}$ to $1\frac{1}{2}$ inch diameter, yellow, pink and magenta. Few single.

LARGE FLOWERED DOUBLE MIXED (Carter).—Flowers $1\frac{1}{4}$ to $1\frac{1}{2}$ inch diameter, white, yellow and scarlet. Many single.

GRANDIFLORA DOUBLE MIXED (Watkins & Simpson, Cooper-Taber).—Flowers $1\frac{1}{4}$ to $1\frac{1}{2}$ inch diameter, white, yellow, scarlet and magenta. Few single.

B. Flowers single.

1. Flowers rosy-magenta.

GIANT FLOWERED PARANA (Burpee).—Height 4 to 6 inches; habit prostrate; flowers $1\frac{1}{2}$ inch diameter, single, bright rosy-magenta. Flowering from July 12.

2. Flowers of various colours.

GRANDIFLORA SINGLE (Dobbie).—Height 5 inches; flowers $1\frac{1}{4}$ to $1\frac{1}{2}$ inch diameter, pink, yellow and scarlet. A few doubles.

GRANDIFLORA MIXED (Watkins & Simpson).—Flowers $1\frac{1}{2}$ to $1\frac{1}{2}$ inch diameter, yellow, scarlet and magenta. A few doubles.

SINGLE MIXED (Barr, R. Veitch).—Flowers $1\frac{1}{2}$ to $1\frac{1}{2}$ inch diameter, yellow, scarlet and magenta. A few doubles.

LARGE FLOWERED SINGLE MIXED (Carter).—Flowers $1\frac{1}{2}$ to $1\frac{1}{2}$ inch diameter, yellow, pink and scarlet. A few doubles.

EVERLASTING FLOWERS.

By everlasting flowers is meant flowers which retain their form and colour after gathering for a long time without water. Most of these plants belong to the family Compositae, but Statice may be included, and is indeed largely grown commercially on account of the lasting quality of the perianth.

They were represented in the trial by three stocks of *Acroclinium*, three of *Rhodanthe*, twenty-one of *Helichrysum*, and three of *Statice*. The seeds of all were sown under glass in mid-April and the seedlings planted out on June 4 in rows 12 to 16 inches apart, according to the size of the plant, and 6 to 8 inches apart in the rows.

ACROCLINIUM.

DESCRIPTIONS AND NOTES.

1. *Flowers white.*

ALBUM (Watkins & Simpson).—Height 18 inches; flowers semi-double, $1\frac{1}{2}$ inch diameter, white, disc lemon-yellow. Flowering from July 8.

2. *Flowers pale rose-pink.*

ROSEUM (Barr, Watkins & Simpson).—Height 18 inches; flowers semi-double, $1\frac{1}{2}$ inch diameter, bright pale rose-pink, disc lemon. Flowering from July 5.

RHODANTHE.

DESCRIPTIONS AND NOTES.

1. *Flowers white.*

MACULATA ALBA (Watkins & Simpson).—Height 12 inches; flowers 1 inch diameter, semi-double, white, disc yellow. Flowering from July 5.

2. *Flowers rose.*

MANGLESII (Watkins & Simpson).—Height 12 inches; flowers 1 inch diameter, semi-double, bright rose, disc yellow. Flowering from July 5.

MACULATA (Watkins & Simpson).—Characters as 'Manglesii,' but flowers bright rose, with a narrow crimson zone at the base of the rays.

HELICHRYSUM.

AWARDS, DESCRIPTIONS AND NOTES.

1. *Flowers white.*

AWARD.

Silver Ball, H.C. July 30, 1926. Raised and sent by Messrs. J. Carter of Raynes Park, S.W.

SILVER BALL (Carter), H.C.—Height 3 feet; flowers 2 to $2\frac{1}{2}$ inches diameter, white. Flowering from July 13. A very good even stock.

SILVER KING (Barr).—Height $3\frac{1}{2}$ to 4 feet; flowers 2 to $2\frac{1}{2}$ inches diameter, white. Flowering from July 13. Irregular in height; contained yellow rogues.

DOUBLE WHITE (R. Veitch).—Like 'Silver King.' Stock true.

2. *Flowers yellow.*

GOLDEN BALL (Dawkins).—Height 3 feet; flowers $1\frac{1}{2}$ to 2 inches diameter, pale creamy-primrose. Flowering from July 13. Contained pink and white rogues.

CANARY YELLOW (Waller-Franklin).—Height $3\frac{1}{2}$ feet; flowers $1\frac{1}{2}$ to $2\frac{1}{2}$ inches diameter, primrose-yellow. Flowering from July 24. Contained white rogue.

GOLDEN KING (Barr).—Height $3\frac{1}{2}$ to 4 feet; flowers 2 to $2\frac{1}{2}$ inches diameter, rich yellow. Flowering from July 18. Contained rose and bronze rogues.

3. *Flowers salmon-pink.*

SALMON PINK (Watkins & Simpson).—Height 32 inches; flowers $1\frac{1}{2}$ to $1\frac{1}{2}$ inch diameter, dull salmon-pink. Flowering from July 28. A good even stock.

4. *Flowers rose.*

DEEP ROSE (Waller-Franklin).—Height $3\frac{1}{2}$ feet; flowers $1\frac{1}{2}$ to $1\frac{1}{2}$ inch diameter, bright pale rose; flowering from July 28. Contained paler rogues, otherwise a good stock.

ROSE CARMINE (Watkins & Simpson), H.C.—Height $3\frac{1}{2}$ feet; flowers $1\frac{1}{2}$ to 2 inches diameter, bright rose-carmine. Flowering from July 13. Contained yellow, pink, and red rogues.

PINK BEAUTY (Dawkins).—Height $3\frac{1}{2}$ feet; flowers 2 to $2\frac{1}{2}$ inches diameter, dull rosy-red. Flowering from July 13. Contained many bronze-red, and a few pale-pink rogues.

5. *Flowers terra-cotta.*

AWARD.

Bright Terra-cotta, H.C. July 30, 1926. Sent by Messrs. Watkins & Simpson of Drury Lane, Covent Garden, W.C.

BRIGHT TERRA-COTTA (Watkins & Simpson), H.C.—Height $3\frac{1}{2}$ feet; flowers $1\frac{1}{2}$ to 2 inches diameter, pale terra-cotta. Flowering from July 13.

6. *Flowers bronzy-scarlet.*

AWARD.

Fireball, H.C. August 12, 1926. Raised and sent by Messrs. J. Carter.

FIREBALL (Carter), H.C.—Height 4 feet; flowers $1\frac{1}{2}$ to 2 inches diameter, bronzy-scarlet. Flowering from July 13.

FIREBALL (Barr, Dawkins).—Less good stocks of the last.

GOLDEN GLOBE (Waller-Franklin).—Height 3 feet; flowers $1\frac{1}{2}$ to 2 inches diameter, bronzy-scarlet. Flowering from July 28.

7. *Flowers violet-maroon.*

VIOLET (Waller-Franklin).—Height 4 feet; flowers $1\frac{1}{2}$ to 2 inches diameter, rich dark violet-maroon. Flowering from July 28. A good even stock.

8. *Flowers of mixed colours.*

AWARD.

Monstrosam Double Mixed, H.C. August 12, 1926. Sent by Messrs. R. Veitch of Exeter.

MONSTROSUM DOUBLE MIXED (R. Veitch), H.C.—Height 4 feet; flowers $1\frac{1}{2}$ to 2 inches diameter, contained pink, rose, white and bronzy-scarlet. Flowering from July 13.

MONSTROSUM MIXED (Nutting, Burpee).—Contained many white and rose, a few yellow and bronze flowered plants; Messrs. Burpee's stock contained a good mixture of white, bronze, rose and violet flowered plants.

MONSTROSUM FLORE PLENO MIXED (Herb).—Contained mostly white and rose, with a few terra-cotta flowered plants.

LARGE FLOWERED DOUBLE MIXED (Barr).—Contained mostly bronze and violet-maroon, with a few rose flowered plants.

STATICE.

AWARDS, DESCRIPTIONS AND NOTES.

1. *Flowers rosy-pink.*

AWARD.

Sinuata Rosea Superba, H.C. August 12, 1926. Sent by Messrs. Watkins & Simpson of Drury Lane, Covent Garden, W.C.

SINUATA ROSEA SUPERBA (Watkins & Simpson), H.C.—Height 24 to 26 inches; flowers $\frac{1}{4}$ inch diameter, white calyx, bright rosy-pink. Flowering from August 14. A good even stock.

2. *Flowers lavender-blue.*

AWARD.

Sinuata True Blue, H.C. August 12, 1926. Sent by Messrs. Watkins & Simpson and Messrs. Nutting of Southwark St., S.E.

SINUATA TRUE BLUE (Watkins & Simpson, Nutting), H.C.—Height 22 to 24 inches; flowers $\frac{1}{4}$ inch diameter, creamy white calyx, bright lavender-blue. Flowering from August 14. Good even stocks.

COSMOS.

Twenty-eight stocks of Cosmos were received for trial. They were sown under glass on March 25, and planted out May 31 in rows 16 inches apart, 8 inches between the plants. Subject to this treatment most flowered satisfactorily by the end of July, but 'Pink and White,' from Mr. E. W. White, 'Double-crested or Anemone-flowered,' from Messrs. J. C. Wheeler, 'bipinnata tardiflora fl. pl.,' from M. Herb, and 'Klondyke,' from Messrs. Barr and Herb, failed to flower. Delayed flowering was at one time characteristic of these Mexican annuals, but selection for earliness has enabled growers to have them in flower in reasonable time.

AWARDS, DESCRIPTIONS AND NOTES.

A. *Flowers single.*1. *Flowers white.*

AWARD.

White, A.M. July 30, 1926. Sent by Messrs. W. H. Simpson of Birmingham.

WHITE (W. H. Simpson), A.M.—Height 3 feet; flowers 3 to 3 $\frac{1}{2}$ inches diameter, white. Flowering from July 12.

EARLY WHITE QUEEN (Carter).—Height 3 feet; flowers 2 to 2 $\frac{1}{2}$ inches diameter, white. Flowering from July 12. Contained pink and late-flowering rogues.

WHITE QUEEN (Dobbie).—Height 2 $\frac{1}{2}$ to 2 $\frac{1}{2}$ feet; flowers 2 to 2 $\frac{1}{2}$ inches diameter, white. Flowering from July 12. Contained late-flowering rogues.

2. *Flowers white, pale flushed carmine.*

GIANT BLUSH QUEEN (Watkins & Simpson).—Height 3 feet; flowers 2 $\frac{1}{2}$ to 2 $\frac{1}{2}$ inches diameter, white, faintly flushed pale carmine, base darker. Flowering from July 12. Contained pink rogues.

3. *Pale rose-pink.*

AWARD.

Rose Queen, H.C. July 30, 1926. Sent by Messrs. Dobbie of Edinburgh.

FAIRY QUEEN (Watkins & Simpson).—Height 2 $\frac{1}{2}$ feet; flowers 2 to 2 $\frac{1}{2}$ inches diameter, pale rose-pink. Flowering from July 12. Contained late-flowering rogues.

EARLY GIANT BLUSH QUEEN (Carter).—Height 3 feet; flowers 2 to 2½ inches diameter, pale rose-pink. Flowering from July 14.

PINK (Waller-Franklin).—Height 3 feet; flowers 2½ to 2½ inches diameter, pale rose-pink. Flowering from July 16.

NEW EARLY FLOWERING ROSE-PINK (R. Veitch).—Height 3½ feet; flowers 2 to 2½ inches diameter, pale rose-pink. Flowering from July 12. Contained late-flowering rogues.

ROSE QUEEN (Dobbie), H.C.—Height 3½ feet; flowers 2 to 2½ inches diameter, pale rose-pink. Flowering from July 9.

ROSE (W. H. Simpson).—Much like 'Rose Queen.' Contained carmine and late-flowering rogues.

4. *Bright purplish-magenta.*

AWARD.

New Early Flowering Crimson, H.C. July 30, 1926. Raised by Messrs. R. Veitch of Exeter and sent by them and Messrs. W. H. Simpson.

NEW EARLY FLOWERING CRIMSON (R. Veitch, W. H. Simpson), H.C.—Height 3 feet; flowers 2 to 2½ inches diameter, bright purplish-magenta. Flowering from July 12.

5. *Flowers mixed colours.*

NEW GIANT HYBRIDS (Watkins & Simpson).—Height 3½ feet. Flowering from July 12.

EARLY LARGE FLOWERED MIXED (Barr).—Height 3½ feet. Flowering from July 12.

B. *Flowers double.*

1. *Flowers white.*

DOUBLE EARLY FLOWERED WHITE (Watkins & Simpson).—Height 2½ feet; flowers 1½ to 2 inches diameter, white, inner petals creamy-white. Flowering from July 12. 80 per cent. single.

WHIRLWIND (Waller-Franklin, Heinemann).—Height 2 feet; flowers 2 to 2½ inches diameter, white, inner petals creamy-white. Flowering from July 12. Contained pink rogue. 50 per cent. single.

2. *Flowers pale rose-pink.*

PEACH BLOSSOM (Waller-Franklin, Heinemann).—Height 2½ feet; flowers 2 to 2½ inches diameter, pale rose pink. Flowering from July 12. 88 per cent. single.

DOUBLE EARLY FLOWERED PINK (Watkins & Simpson).—Height 3 feet; flowers 2½ inches diameter, pale rose-pink. Flowering from July 12. Contained late-flowering and magenta rogues. 66 per cent. single.

BIPINNATA PRAECOX FLORE PLENO (Herb).—Height 3 feet; flowers 2 inches diameter, pale rose-pink. Flowering from July 12. Contained white and magenta rogues. 75 per cent. single.

3. *Flowers bright purplish-magenta.*

CARNELIA (Waller-Franklin, Heinemann).—Height 3 feet; flowers 2 inches diameter, bright purplish-magenta. Flowering from July 12. Contained pink and late-flowering rogues. 88 per cent. single.

NEMESIA.

These are perhaps the most lasting of all the present selection of Annuals in the garden and the most popular. Thirty-two stocks were sent in for trial, sown under glass on April 7, and planted on June 1 in rows 12 inches apart, 6 inches apart in the rows. As will be seen, they began to flower at the latter end of June and they continued well into autumn. Several stocks sent under varietal names showed more variation than is desirable in a specially named stock and more than actually need be, and the best stocks are marked by awards.

AWARDS, DESCRIPTIONS AND NOTES.

A. Compact habit, flowers small.*1. Flowers white.*

WHITE GEM (Watkins & Simpson).—Height 12 inches; of compact habit; flowers $\frac{1}{4}$ to $\frac{3}{8}$ inch diameter, white, centre cream. Flowering from June 29. Contained blue and lilac rogues.

2. Flowers orange.

AWARD.

Orange Prince, H.C. July 30, 1926. Raised by Mr. W. H. Gardiner and sent by Messrs. W. H. Simpson of Birmingham [A.M. 1916 (Dobbie)].

ORANGE PRINCE (W. H. Simpson), **H.C.**—Height 9 inches; of compact habit; flowers 1 inch diameter, bright orange blotched blackish-blue on upper lip. Flowering from July 1.

ORANGE PRINCE (Watkins & Simpson, Carter).—Less true stocks of the last.
ORANGE (Dawkins, Heinemann).—Mixed stocks.

3. Flowers crimson.

AWARD.

Fire King, H.C. July 30, 1926. Sent by Messrs. W. H. Simpson.

FIRE KING (W. H. Simpson), **H.C.**—Height 9 inches; of compact habit; flowers $\frac{3}{8}$ inch diameter, bright rich crimson. Flowering from June 26.

FIRE KING (Watkins & Simpson).—A less good stock of the last.

4. Flowers pale blue.

AWARD.

Blue Gem, H.C. July 30, 1926. Sent by Messrs. Watkins & Simpson of Drury Lane, Covent Garden, W.C.

BLUE GEM (Watkins & Simpson), **H.C.**—Height 9 to 12 inches; of compact habit; flowers $\frac{1}{4}$ inch diameter, pale sky-blue. Flowering from June 23.

BLUE GEM (W. H. Simpson, Carter, Dobbie, Barr).—Less true stocks of the last.

5. Flowers of various colours.

AWARDS.

Dwarf Compact Hybrids, H.C. July 30, 1926. Sent by Messrs. W. H. Simpson.

New Dwarf Hybrids, H.C. July 30, 1926. Sent by Messrs. Barr of King St., Covent Garden, W.C.

Dwarf Rainbow, H.C. July 30, 1926. Raised and sent by Messrs. J. Carter of Raynes Park, S.W.

Triumph, H.C. July 30, 1926. Raised and sent by Messrs. Heinemann of Erfurt, Germany.

DWARF COMPACT HYBRIDS (W. H. Simpson), **H.C.**—Height 9 to 12 inches; flowers $\frac{1}{4}$ inch diameter; cream, orange and rose flowered plants. Flowering from June 25.

NEW DWARF HYBRIDS (Barr), **H.C.**—Height 10 inches; flowers $\frac{1}{4}$ inch diameter; white, orange and blue flowered plants. Flowering from June 27.

DWARF RAINBOW (Carter), **H.C.**—Height 10 inches; flowers $\frac{1}{4}$ inch diameter; white, orange and rose flowered plants. Flowering from June 27.

COMPACTA (Hinton).—Flowers white, cream, carmine and rosy-crimson.

COMPACTA SPECIAL MIXTURE (Dawkins).—Mostly white, cream and orange. Stock not true to type.

COMPACTA GRANDIFLORA (Cooper-Taber).—Flowers white, cream, orange and blue.

TRIUMPH (Heinemann), **H.C.**—Height 10 to 12 inches; flowers $\frac{1}{4}$ inch diameter, cream and rosy-crimson shades. Flowering from June 25.

TRIUMPH (Watkins & Simpson).—A less even stock of the last.

B. Spreading habit, flowers large.**1. Flowers of various colours.****AWARDS.**

strumosa Suttonii, H.C. July 30, 1926. Sent by Messrs. Daehnfeldt & Jensen of Copenhagen, Denmark, and Messrs. Barr.

Large Flowered, H.C. July 30, 1926. Raised and sent by Messrs. R. Veitch of Exeter.

Large Flowered Mixed, H.C. July 30, 1926. Sent by Messrs. J. Carter.

strumosa reticulata, H.C. July 30, 1926. Sent by Messrs. Watkins & Simpson.

STRUMOSA SUTTONII (Daehnfeldt & Jensen, Barr), H.C.—Height 15 to 18 inches, of spreading habit; flowers 1 inch diameter, crimson, scarlet, cream shades. Flowering from June 26.

STRUMOSA SUTTONII (Kelway, Herb).—Less regular stocks of the last.

SUTTONII (W. H. Simpson, Watkins & Simpson).—Stocks not quite true to type.

STRUMOSA GRANDIFLORA (Nutting).—Characters of 'Strumosa Suttonii.'

LARGE FLOWERED (R. Veitch), H.C.—Characters of 'Strumosa Suttonii.' Flowers mostly of orange and scarlet shades.

LARGE FLOWERED MIXED (Carter), H.C.—Characters of 'Strumosa Suttonii.' Flowers mostly orange, scarlet and rosy-scarlet shades.

TRIUMPH (Dobbie).—Characters of 'Strumosa Suttonii.' Stock not true to type.

STRUMOSA RETICULATA (Watkins & Simpson), H.C.—Height 15 to 18 inches; of spreading habit; flowers $\frac{3}{4}$ to 1 inch diameter, rose, scarlet, orange, each flower being striped and mottled a darker colour. Flowering from June 27.

VISCARIA.

Thirty stocks of *Viscaria* were sent for trial, and both those sown under glass and those sown in the open in mid-March grew equally well and flowered at the same time. The rows were 8 inches apart and the plants 6 inches apart in the rows. *Lychnis Viscaria* is a native of Europe (including Britain) and Siberia which has given rise to a considerable number of very pleasing varieties of good habit. The main variation in the plants of the stocks tried was in the height, and a good deal of synonymy was disclosed.

AWARDS, DESCRIPTIONS AND NOTES.**1. Flowers white.****AWARD.**

Egret, H.C. July 30, 1926. Raised and sent by Messrs. J. Carter of Raynes Park, S.W.

INNOCENCE (Heinemann).—Height 8 to 12 inches; habit compact; flowers $1\frac{1}{2}$ inch diameter, white. Flowering from July 10. Irregular in height, contained pink and lilac rogues.

EGRET (Carter), H.C.—Height 22 inches; habit spreading; flowers $1\frac{1}{2}$ inch diameter, white. Flowering from July 8.

OCULATA CANDIDA (Watkins & Simpson) } —Height 22 to 24 inches; flowers
CANDIDA (W. H. Simpson) }
 $1\frac{1}{2}$ to $1\frac{3}{4}$ inch diameter, creamy-white. Flowering from July 12. Stocks contained pink and lilac rogues.

2. Flowers rose.**AWARD.**

oculata, H.C. July 30, 1926. Sent by Messrs. R. Veitch of Exeter.

OCULATA (R. Veitch), H.C.—Height 20 to 24 inches; habit spreading; flowers $1\frac{1}{2}$ to $1\frac{3}{4}$ inch diameter, amaranth-pink. Flowering from July 8.

CARDINALIS (Carter).—Characters of 'Oculata'; sent in error.

OCULATA NOBILIS (Watkins & Simpson).—Height 20 to 22 inches; flowers $1\frac{1}{2}$ to $1\frac{3}{4}$ inch diameter, pale rosy-pink, fades. Flowering from July 12. Contained lilac rogues.

TOM THUMB ROSE GEM (Watkins & Simpson, Barr) } —Height 9 to 12 inches;
ROSE GEM (W. H. Simpson, Dawkins) }
 habit compact; flowers $1\frac{1}{2}$ to $1\frac{3}{4}$ inch diameter, bright rose. Flowering from July 10. Irregular in height.

3. *Flowers scarlet.*

AWARD.

Fire King, H.C. July 30, 1926. Sent by Messrs. Watkins & Simpson of Drury Lane, Covent Garden, W.C.

BRIGHT ROSE (Heinemann).—Height 10 inches; of compact habit; flowers $1\frac{1}{2}$ inch diameter, rosy-scarlet. Flowering from July 12. Contained pale rose and lilac rogues.

CARDINALIS (R. Veitch, Dobbie, Barr).—Height 20 to 22 inches; spreading; flowers $1\frac{1}{2}$ to $1\frac{3}{4}$ inches diameter, rosy-scarlet. Flowering from July 8.

FIRE KING (Watkins & Simpson), **H.C.**—Height 12 to 15 inches; flowers $1\frac{1}{2}$ to $1\frac{3}{4}$ inch diameter, scarlet. Flowering from July 8.

FIRE KING (R. Veitch, Barr).—Less good stocks of the last.

4. *Flowers lavender.*

AWARD.

oculata coerules, H.C. July 30, 1926. Sent by Messrs. W. H. Simpson of Birmingham. Also sent by Messrs. Barr as 'Blue Gem' in error, and by Messrs. Carter as 'Blue Bird'; these share the award.

BLUE GEM (W. H. Simpson, Watkins & Simpson, Dawkins).—Height 9 to 12 inches; of compact habit; flowers $1\frac{1}{2}$ to $1\frac{3}{4}$ inch diameter, lavender-lilac; flowering from July 12. Irregular in height.

OCULATA COERULEA (W. H. Simpson), **H.C.**—Height 12 inches; of compact habit; flowers $1\frac{1}{2}$ to $1\frac{3}{4}$ inch diameter, lavender-lilac. Flowering from July 8. Also sent by Messrs. Barr as 'Blue Gem' in error.

OCULATA COERULEA (Watkins & Simpson).—A less good stock of the last.

BLUE BIRD (Carter), **H.C.**—Characters of 'oculata coerulesa.'

LILAC (Carter).—Height 20 inches; flowers $1\frac{1}{2}$ to $1\frac{3}{4}$ inch diameter, lavender-lilac, fades somewhat. Flowering from July 8.

OCULATA (Dobbie).—Characters as 'Lilac,' sent in error.

LOYALTY (Dawkins, Heinemann).—Height 9 to 12 inches; habit compact; flowers $\frac{3}{4}$ inch diameter, lavender-blue. Flowering from July 10. Height irregular.

5. *Flowers mixed colours.*

SPLENDID MIXTURE (Heinemann).—Height 9 to 12 inches; of compact habit; flowers $\frac{3}{4}$ inch diameter, mostly rose and rosy-scarlet shades. Flowering from July 12.

LAVATERA.

Of these tall floriferous annuals ten stocks were received. They were sown in rows 18 inches apart on March 15, and thinned to 8 inches apart in the rows. All the forms described below belonged to the species *L. Trimestris*, but one stock of *L. arborea* was sent, which is, of course, not an annual, nor capable of flowering in the first year under this treatment. The variations seen in the stocks are shown below.

AWARDS, DESCRIPTIONS AND NOTES.

1. *Flowers white.*

AWARD.

Splendens alba, H.C. July 30, 1926. Raised by Messrs. Watkins & Simpson and sent by Messrs. W. H. Simpson of Birmingham.

SPLENDENS ALBA (W. H. Simpson), **H.C.**—Height $3\frac{1}{2}$ to 4 feet; flowers $2\frac{1}{2}$ inches diameter, white. Flowering from July 18.

SPLENDENS ALBA (Watkins & Simpson, Barr).—Less good stocks of the last.

2. *Flowers rose-pink.*

AWARDS.

Splendens Sunset, **A.M.** July 30, 1926. Raised by Messrs. Watkins & Simpson and sent by Messrs. Watkins & Simpson of Drury Lane, Covent Garden, W.C., and Messrs. W. H. Simpson.

Splendens rosea, **H.C.** July 30, 1926. Sent by Messrs. Barr of King St., Covent Garden, W.C.

SPLENDENS ROSEA (Barr), **H.C.**—Height $3\frac{1}{2}$ feet; flowers $2\frac{1}{2}$ inches diameter, bright rose-pink. Flowering from July 18.

ROSEA SPLENDENS (Cooper-Taber, Nutting).—Like the last, but contained white-flowered rogues.

CARMINE QUEEN (Dobbie).—Like 'Splendens rosea'; an irregular stock.

* * *

SPLENDENS SUNSET (Watkins & Simpson, W. H. Simpson), **A.M.**—Height $3\frac{1}{2}$ feet; flowers 3 inches diameter, bright rich rose-pink; very free flowering. Flowering from July 18.

NEMOPHILA.

Twenty stocks of three species of the North American annual *Nemophilas* were received, sown outdoors in rows 12 inches apart, and thinned to 6 inches apart in the rows. Both rows and spaces might have been increased with advantage. They started to flower about mid-May, and were at their best about the end of June, passing quickly over when hot weather set in. The greatest beauty of the *Nemophilas* is in the blue forms, and they display it best when they flower in the earlier part of the summer after autumn sowing.

AWARDS, DESCRIPTIONS AND NOTES.

1. *Flowers white.*

INSIGNIS ALBA (Watkins & Simpson, W. H. Simpson, Barr).—Height 9 to 12 inches; habit prostrate; flowers $1\frac{1}{2}$ inch diameter, white. Flowering from May 22.

ATOMARIA (Watkins & Simpson, Barr, R. Veitch).—Height 9 to 12 inches; habit prostrate; flowers $\frac{3}{4}$ inch diameter, white dotted with black around base. Flowering from May 22.

2. *Flowers white, tipped purple.*

AWARD.

maculata, **H.C.** July 1, 1926. Sent by Messrs. Watkins & Simpson, Drury Lane, Covent Garden, W.C. Also sent by Messrs. Dobbie of Edinburgh as 'maculata grandiflora'; this shares the award.

MACULATA (Watkins & Simpson), **H.C.**—Height 9 to 12 inches; habit prostrate; flowers $1\frac{1}{2}$ inch diameter; white, blotched purplish-violet at the tip of each petal. Flowering from May 22.

MACULATA GRANDIFLORA (Dobbie), **H.C.**—Characters as above.

3. *Flowers Cambridge-blue.*

AWARD.

Insignis, **H.C.** July 1, 1926. Sent by Messrs. W. H. Simpson of Birmingham; Kelway of Langport, Somerset; Dobbie.

INSIGNIS (W. H. Simpson, Kelway, Dobbie), **H.C.**—Height 9 to 12 inches; habit prostrate; flowers $1\frac{1}{2}$ inch diameter, Cambridge-blue, with broad white zone at base. Flowering from May 22.

INSIGNIS (Watkins & Simpson).—Like the last, but contained white-flowered rogues.

INSIGNIS GRANDIFLORA (Barr).—Characters as 'Insignis.' Contained white-flowered rogues.

4. *Flowers Oxford-blue.*

ATOMARIA BLUE BELL (Barr).—Height 9 to 12 inches; habit prostrate; flowers $\frac{3}{4}$ inch diameter, soft phenyl-blue, zoned white, dotted black at base. Flowering from May 22.

ATOMARIA ATRO-VIOLEACEA (Barr, R. Veitch).—Height 9 to 12 inches; habit prostrate; flowers 1 to $1\frac{1}{4}$ inch diameter, Oxford-blue, base blotched reddish-purple. Flowering from May 22. The first stock contained many paler-flowered rogues.

5. *Flowers purplish-maroon.*

DISCOIDALIS (Watkins & Simpson, Barr).—Height 6 to 8 inches; habit prostrate; flowers $\frac{3}{4}$ to $1\frac{1}{4}$ inch diameter, purplish-maroon, edged white. Flowering from May 22.

DISCOIDALIS ELEGANS (Dobbie).—Characters as 'Discoidalis.'

6. *Flowers mixed.*

INSIGNIS MIXED (Herb).—Contained half Cambridge-blue and half white-flowered plants.

LINUM.

Two species of *Linum* were represented in the fourteen stocks sent in for trial, although all came under the good selling name of *grandiflorum*. *L. grandiflorum* is a rose-coloured form less useful than its variety *rubrum*, which is brighter and deeper in colour. The taller blue-flowered forms belonged to *L. usitatissimum*, a beautiful species, but apt to pass rather quickly out of flower if its seeds are allowed to ripen. The plants were allowed 4 inches apart in rows 9 inches apart.

AWARDS, DESCRIPTIONS AND NOTES.

1. *Flowers light lavender-blue.*

AWARD.

grandiflorum Blue, H.C. July 1, 1926. Sent by Messrs. Watkins & Simpson, Drury Lane, Covent Garden, W.C.

GRANDIFLORUM BLUE (Watkins & Simpson), H.C.—Height 3 to $3\frac{1}{2}$ feet; flowers $\frac{3}{4}$ inch diameter, single, light lavender-blue. Flowering from June 8.

GRANDIFLORUM BLUE (Barr, W. H. Simpson).—Like the last, but contained white-flowered rogues.

GRANDIFLORUM AZUREUM (Dawkins).—Like 'Grandiflorum Blue.'

2. *Flowers old rose.*

GRANDIFLORUM ROSEUM (Barr, Dawkins).—Height 12 to 15 inches; flowers $1\frac{1}{4}$ to $1\frac{1}{2}$ inch diameter, old rose zoned rosy-red at the base. Flowering from June 2. Stocks not quite true.

3. *Flowers rosy-scarlet.*

AWARD.

grandiflorum rubrum, H.C. July 1, 1926. Sent by Messrs. Herb of Naples, Italy. Also sent by Messrs. Kelway as 'Grandiflorum'; this shares the award.

GRANDIFLORUM RUBRUM (Herb), H.C.—Height 18 inches; flowers $1\frac{1}{4}$ inch diameter, rich rosy-scarlet, zoned pale chestnut at the base. Flowering from June 2.

GRANDIFLORUM RUBRUM (W. H. Simpson, Watkins & Simpson, R. Veitch, Dawkins, Dobbie).—Less good stocks of the last.

GRANDIFLORUM (Kelway), H.C.—Like 'grandiflorum rubrum.'

GRANDIFLORUM COCCINEUM (Barr).—Like 'grandiflorum rubrum.'

SAVOYS TRIED AT WISLEY, 1926.

AWARDS, DESCRIPTIONS, AND NOTES.

A. Early Varieties.

(Maturing by end of October.)

AWARD.

Favourite, A.M. September 1, 1926. Raised by Messrs. Sluis & Groot and sent by Messrs. Harrison of Leicester. Award for early use.

1. Heads pointed.

FAVOURITE (Harrison), **A.M.**—Plant 9 inches in height, dark bright green; heads roundish, pointed, 5 inches diameter, solid. Ready September 1. A good even stock. Suitable for small gardens.

EARLY ULM (Dickson & Robinson).—Plant 12 inches in height, dark dull green; heads flat-round, pointed, 6 inches diameter, very solid. Ready September 3. Stock not quite true.

LITTLE PIXIE (A. Dickson).—Plant 10 to 12 inches in height, dark dull green; heads conical, 5 inches diameter, solid. Ready October 22. Contained paler rogues. Suitable for small gardens.

PERFECT GEM (Dobbie).—Plant 12 inches in height, dark bright green; heads conical, $4\frac{1}{2}$ inches diameter, solid. Ready October 28. Stands well.

ALL HEAD (Heinemann).—Plant 14 inches in height, medium dull green; heads conical, 6 inches diameter, somewhat loose. Ready September 20. Somewhat damaged by frost.

MIDSUMMER (Nutting).—Plant 13 to 15 inches in height, dark dull green, head leaves yellowish; heads conical, $6\frac{1}{2}$ inches diameter, solid. Ready September 9. Turning in irregularly.

GOLDEN GLOBE (Nutting).—Plant 14 inches tall, light yellowish green, head leaves creamy-yellow; heads conical, $6\frac{1}{2}$ inches diameter, somewhat loose. Ready October 28. Damaged by frost. A good even stock.

2. Heads round.

TOM THUMB RE-SELECTED (Carter).—Plant 9 to 12 inches tall, dark dull green; heads 5 inches diameter, very solid. Ready September 20. Stands well.

EARLY DWARF ULM (Carter).—Plant 12 to 14 inches tall, dark dull green; heads roundish, $6\frac{1}{2}$ inches diameter, solid. Ready October 28. Variable in height. Stands well.

DWARF GREEN CURLED (Cullen, Dickson & Robinson, Carter, Kelway, R. Veitch, Cooper-Taber).—Plant 13 to 14 inches tall, dark bright green, outer leaves few; heads 6 inches diameter, solid. Ready October 28. Stands well. Messrs. Cullen's, Dickson & Robinson's and Cooper-Taber's stocks were good and true. [A stock from Messrs. Dobbie sent under this name was quite distinct. See below "Green curled selected."]

GREEN CURLED (Nutting).—Like 'Dwarf Green Curled.'

VICTORIA (Harrison).—Like 'Dwarf Green Curled.' Variable in size and shape of heads.

PERFECTION (A. Dickson).—Like 'Dwarf Green Curled.'

KITZING (Zwaan & van der Molen).—Plant 12 to 14 inches tall, dark dull green; heads 6½ inches diameter, very solid. Ready September 20. Damaged by frost. Variable in shape of heads and colour of foliage.

* * *

IRONHEAD (Heinemann).—Plant 9 to 10 inches tall, dark dull green; heads 7 inches diameter, solid. Ready September 9. Turning in irregularly. Stock not true.

* * *

EARLY DAWN (Kelway).—Plant 14 inches tall, dark dull grey-green, foliage less bullate than some; heads 6½ inches diameter, solid. Ready September 9. Damaged by frost. Turning in irregularly.

* * *

PERFECTION (W. H. Simpson).—Plant 12 to 13 inches tall, dark dull grey-green; heads 8 inches diameter, solid. Ready October 28. Damaged somewhat by frost. Distinct from 'Perfection' sent by Messrs. A. Dickson and Messrs. Finney.

* * *

GOTHA (Heinemann).—Plant 10 to 12 inches tall, dark dull grey-green; heads 6½ inches diameter, very solid. Ready September 20. Damaged by frost.

* * *

ASTI (Herb).—Plant 13 inches tall, medium to dark dull green; heads 6½ inches diameter, solid. Ready October 20. Damaged by frost.

B. Midseason Varieties.

(Maturing November to mid-December.)

AWARDS.

Belleville, A.M. January 20, 1927. Sent by Messrs. Watkins & Simpson of Drury Lane, Covent Garden, W.C. (A.M. 1921). Award for small garden cultivation.

Late Drumhead, A.M. January 20, 1927. Sent by Messrs. Cullen of Witham (A.M. 1917).

Perfection, H.C. January 20, 1927. Raised and sent by Messrs. Finney of Newcastle.

Yellow King, H.C. January 20, 1927. Raised and sent by Messrs. Zwaan & de Wiljes of Holland.

1. Heads pointed.

BELLEVILLE (Watkins & Simpson), **A.M.**—Plant 6 to 8 inches tall, dark bright green; heads roundish, pointed, very solid, 5½ inches diameter. Ready November 10. A variety which may be planted one foot apart, and very suitable for small gardens.

* * *

HERALD (Kelway). Plant 12 inches tall, very dark dull green; heads 4 inches diameter, roundish, pointed, solid. Ready November 2. A true stock.

* * *

OBELISK-HEAD IMPROVED (Zwaan & de Wiljes).—Plant 12 inches tall, dark bright green; heads 5 inches diameter, conical, large, solid. Ready November 2. Damaged by frost. Contained tall and plain-leaved rogues.

2. Heads round.

HOLLAND EXPORT (Zwaan & van der Molen).—Plant 12 inches tall, medium dull green, head leaves yellowish; heads 8 inches diameter, very solid. Ready November 10. A good even stock.

* * *

ADVENT (Barr).—Plants 13 inches tall, dark dull grey-green; heads 6 inches diameter, very solid. Ready October 28. Contained larger and coarser foliaged rogues.

* * *

GIANT GREEN (Carter).—Plants 14 inches tall, dark bright grey-green; heads 7 inches diameter, solid. Ready November 18. Contained plain foliaged and conical-headed rogues.

3. Drumhead—Heads flattened.

BREDA (Zwaan & de Wiljes).—Plants 12 to 14 inches tall, medium bright green; heads 5 inches diameter, very solid. Ready November 22. Turning in irregularly.

YELLOW KING (Zwaan & de Wiljes), **H.C.**—Plants 13 inches tall, medium dull green; leaves semi-plain; heads 8 inches diameter, very solid. Ready November 24. Somewhat damaged by frost. A useful variety for use in mid-winter.

* * *

GIANT OF NAPLES (Herb).—Plants 16 inches tall, medium dull grey-green; heads 8 to 9 inches diameter, solid. Ready November 2.

* * *

BEST OF ALL (Kelway, Watkins & Simpson, A. Dickson, Cooper-Taber).—Plants 14 inches tall, dark bright grey-green; heads 8 inches diameter, solid. Ready October 28. Somewhat damaged by frost. Messrs. Watkins & Simpson's stock was good and even, that of Messrs. A. Dickson was later to mature than the others.

LEICESTER GIANT (Harrison).—Of 'Best of All' type. Damaged by the weather. Ready November 28.

* * *

GERMEVILLIERS (Watkins & Simpson).—A variety which resembles 'Best of All' except that the foliage is of a duller shade; this was not damaged by the weather.

* * *

DRUMHEAD (R. Veitch, Kelway, W. H. Simpson).—Plants 13 to 14 inches tall, dark bright grey-green; heads 8 to 9 inches diameter, solid. Ready November 18. Stocks variable in shape of head and colour of foliage. Turning in irregularly.

EARLY DRUMHEAD (Cullen).—Like 'Drumhead.' A true stock.

DRUMHEAD SELECTED (Dobbie).—Like 'Drumhead.' Irregular in turning in. Ready November 11.

* * *

LATE DRUMHEAD (Nutting).—Plants 13 to 15 inches tall, very dark dull grey-green; heads 7 inches diameter, very solid. Ready November 28. Turning in irregularly.

LATE DRUMHEAD (Cullen), **A.M.**—A very good stock of the last. Stands well.

LATE GIANT DRUMHEAD (Speed).—Like 'Late Drumhead.'

* * *

ORMSKIRK MEDIUM EARLY (Clucas).—Plants 13 to 14 inches tall, dark dull grey-green; heads 8 inches diameter, very solid. Ready November 10. Earlier and with paler foliage than the 'Ormskirk' type.

ORMSKIRK (A. Dickson).—Like 'Ormskirk Medium Early.' Contained paler foliaged rogues. Turning in irregularly.

* * *

ORMSKIRK EARLY (Clucas).—A variety much like 'Ormskirk Medium Early,' except that the foliage is much darker. Turning in irregularly.

* * *

PERFECTION (Finney), **H.C.**—Plants 12 to 13 inches tall, very dark dull grey-green; heads 7 inches diameter, very solid. Ready November 30. A good hardy variety. Somewhat resembles the earlier form of the 'Ormskirk' type.

C. Late Varieties.

(Maturing December and standing well.)

AWARDS.

New Year, A.M. January 20, 1927. Sent by Messrs. H. J. Speed of Evesham.
Ormskirk Late Green, A.M. January 20, 1927. Raised and sent by Messrs. Clucas of Ormskirk, Lancs. (A.M. 1921).

Late Market, H.C. January 20, 1927. Raised and sent by Messrs. Finney.

Cartersone, C. January 20, 1927. Introduced and sent by Messrs. Carter of Raynes Park, S.W.

Green Curled selected C. January 20, 1927. Sent by Messrs. Dobbie of Edinburgh (A.M. 1917).

1. Heads pointed.

CARTERCONC (Carter), **C.**—Plants 12 to 14 inches tall, very dark green; heads conical, 5½ inches diameter, solid. Ready December 10. A variety suitable for private gardens.

2. *Heads sugarloaf.*

NEW CONE HEADED (Barr).—Plants 16 inches tall, dark bright green; head leaves yellowish; heads sugarloaf, 5 inches diameter, solid. Ready December 10. A good stock.

3. *Heads round.*

NEW YEAR (Harrison).—Plants 14 inches tall, very dark dull grey-green; heads 7 inches diameter, solid. Ready December 22. Turning in irregularly. Stands well.

* * *

NEW YEAR (Speed), A.M.—A selection from the last, but with somewhat less bullate leaves. A very good even stock. Stands well. Ready December 22.

* * *

OMEGA (Watkins & Simpson).—Plants 14 to 15 inches tall, very dark dull grey-green; heads $6\frac{1}{2}$ to 7 inches diameter, very solid. Ready January 10. Turning in irregularly. Stands well.

4. *Drumhead.*

GREEN CURLED SELECTED (Dobbie), C.—Plants 14 to 15 inches tall, very dark dull grey-green; heads $6\frac{1}{2}$ inches diameter, rather loose. Ready January 10. Somewhat variable in foliage. Stands well. Distinct from others of this name.

* * *

LATE MARKET (Finney), H.C.—Plants 14 inches tall, very dark dull green; heads 7 to 8 inches diameter, very solid. Ready December 30. Stands well. Distinct from the variety sent under this name by Messrs. Nutting.

* * *

LATEST OF ALL (Watkins & Simpson).—Plants 14 to 15 inches tall, very dark grey-green; heads 7 inches diameter, solid. Ready January 10. Turning in irregularly. Somewhat resembles the 'Ormskirk' type.

* * *

ORMSKIRK CHAMPION (Kelway).—Plants 14 to 15 inches tall, very dark dull grey-green; heads $7\frac{1}{2}$ to 9 inches diameter, solid. Ready December 12. Turning in irregularly. Variable in colour of foliage.

* * *

ORMSKIRK LATE GREEN (Clucas), A.M.—Plants 14 to 15 inches tall, very dark dull grey-green; heads $7\frac{1}{2}$ to $8\frac{1}{2}$ inches diameter, very solid. Ready January 8. A very good even stock, the best stock in the trial. Stands very well.

ORMSKIRK LATE GREEN (Barr).—A less regular stock of the last.

ORMSKIRK MEDIUM LATE (Clucas).—Of 'Ormskirk Late Green' type but irregular in turning in. Ready January 8.

ORMSKIRK SELECT LATE (J. W. Scarlett).—A less regular stock of 'Ormskirk Late Green.'

ORMSKIRK (Cooper-Taber, W. H. Simpson, Cullen, Nutting).—Less regular stocks of 'Ormskirk Late Green.'

* * *

ORMSKIRK SUPER LATE (Harrison).—A dwarfier stock, 10 to 12 inches tall, of 'Ormskirk Late Green' type with heads 5 to 6 inches diameter. Growth somewhat weak.

* * *

NORWEGIAN (Harrison, Barr).—Plants 12 to 13 inches tall, very dark dull grey-green; margins of leaves tinged reddish; heads 7 inches diameter, very solid. Ready November 22. Stands well. Stocks variable in colour of foliage.

LATE MARKET (Nutting).—Like 'Norwegian.' Contained paler foliaged plants.

GARDEN SWEDES TRIED AT WISLEY, 1925 AND 1926.

THIRTY-FIVE stocks of Garden Swedes were sown in mid-June in rows 18 inches apart and thinned to 12 inches apart in the rows. The space given was greater than was needed by the smaller-leaved varieties, but none too much for the large, coarser forms.

The awards recommended by the Committee who saw the plants on several occasions and made their final recommendations on December 2 are set out below.

AWARDS, DESCRIPTIONS AND NOTES.

Long Varieties.

Flesh white.

Skin green at top, white below.

SWEET WHITE (Barr).—A coarse, broad, conical-shaped root, $4\frac{1}{2}$ inches wide and 8 inches long, with large dark-green lobed leaves; flesh white, somewhat juicy. A very necky root.

Skin reddish-purple at top, white below.

PURPLE TOP WHITE (Barr).—A long, coarse, conical-shaped root, with very much neck, 4 inches wide and 10 inches long, with large medium to dark-green lobed foliage; flesh white. Regular in size and shape.

Round or Flat Varieties.

Flesh white.

AWARDS.

White Smooth, H.C. December 2, 1926. Sent by Messrs. Daehnfeldt & Jensen of Odense, Denmark.

Early White Selected, H.C. December 2, 1926. Sent by Messrs. Barr of King St., Covent Garden, W.C.

Skin green at top, white below.

WHITE SMOOTH (Daehnfeldt & Jensen), H.C.—A flat to round-shaped root, with very little neck, 4 inches wide and $5\frac{1}{2}$ inches long, with medium dark green lobed leaves. Regular in shape and size.

* * *

WHITE GARDEN (Carter).—A globular-shaped root with a medium neck, $4\frac{1}{2}$ inches wide and 7 inches long, with large medium to dark green lobed leaves. Irregular in shape and size.

* * *

WHITE FLESHED GARDEN (Nutting).—A round to globular-shaped root, $4\frac{1}{2}$ inches wide and 5 inches long, with very little neck, with large medium to dark dull green lobed leaves. Contained strap-leaved rogues.

* * *

WHITE GARDEN (Webb).—A globular-shaped root $4\frac{1}{2}$ inches wide and 6 inches long, with a medium neck; leaves medium to dark dull grey-green, lobed; the upper part of the root faintly tinged red near the neck. Irregular in size.

* * *

EARLY WHITE SELECTED (Barr), H.C.—A round to globular-shaped root, 4 inches wide and $5\frac{1}{2}$ inches long, with very little neck; leaves strap-shaped, dwarf, medium to dark dull grey-green. A good stock.

Flesh yellow.

AWARDS.

Yellow Neckless, H.C. December 2, 1926. Sent by Messrs. Daehnfeldt & Jensen.

Early Yellow, H.C. December 2, 1926. Sent by Messrs. Daehnfeldt & Jensen.

Perfection Purple Top, H.C. December 2, 1926. Sent by Messrs. Dickson & Robinson of Manchester.

Laing's Garden, C. December 2, 1926. Raised by Messrs. Laing & Mather, and sent by Messrs. Kelway of Langport, Somerset.

Garden Selected, C. December 2, 1926. Sent by Messrs. Dobbie of Edinburgh.

Skin green at top, yellow below.

YELLOW NECKLESS (Daehnfeldt & Jensen), **H.C.**—An almost spherical root, 4 inches diameter, with very little neck; leaves strap-shaped, dwarf, medium to dark grey-green; flesh deep yellow; roots one-third out of the soil. A good even stock.

* * *

EARLY YELLOW (Daehnfeldt & Jensen), **H.C.**—A variety with similar characters to those of 'Yellow Neckless' with the exception of the leaves, which are lobed. Flesh yellow.

* * *

KRASNOJE TELSKOJE (Olsen).—A small flat-round rooted variety, 4½ inches wide and 4 inches long, with very little neck, three-fourths out of the soil; leaves small, lobed, medium to dark grey-green; flesh yellow; roots irregular in shape and size.

* * *

GREEN (Dickson & Robinson).—A deeper than broad rooted variety, 4½ inches wide and 7 inches long, with a medium neck, half out of the soil; leaves large, lobed, dark dull grey-green; flesh pale yellow. A good even stock.

Skin reddish at top, yellow below.

PREMIER BRONZE TOP (Dickson & Robinson).—A deeper than broad rooted variety, 4½ inches wide and 5½ inches long, with a medium neck, three-quarters out of the soil; leaves large, lobed; flesh pale yellow, soft and brittle.

* * *

MANCUNIAN (Dickson & Robinson).—A variety with roots half again as long as broad, 60 per cent. above ground; neck medium; roots 4 inches diameter, of good quality, irregular in size; leaves lobed, 16 inches tall; flesh firm, deep cream.

* * *

GREEN TOP TABLE (Carter).—A variety with reddish-bronze topped roots, almost as broad as long, 60 per cent. above ground; neck medium; roots 5 inches diameter; flesh deep cream; leaves lobed, 17 inches tall. A good even stock.

* * *

LAING'S GARDEN (Cooper-Taber, W. H. Simpson, Dobbie).—An almost spherical variety, with medium strap-shaped leaves, 12 to 13 inches tall; roots 4 inches diameter and 60 per cent. above ground, with little neck; flesh firm and juicy, pale cream. Stocks somewhat irregular in shape. Messrs. W. H. Simpson's and Dobbie's stocks contained lobed-leaved rogues. Another variety sent under this name had lobed foliage.

* * *

SUPERLATIVE (Barr).—A longer than broad variety with lobed leaves, 16 inches tall; roots 4 inches across, with a medium neck, 70 per cent. out of the soil; flesh somewhat coarse, yellow.

* * *

EARLY YELLOW SELECTED (Barr).—An almost spherical variety, with large lobed leaves, 16 to 18 inches tall; roots 4½ inches diameter, 60 per cent. above ground; neck medium; flesh fine, deep cream. A good even stock. Distinct from the variety sent under this name by Messrs. Daehnfeldt & Jensen.

CRIMSON TOP TABLE (Barr).—A variety about as deep as broad, almost spherical, with large lobed foliage, 16 to 18 inches tall; roots 5 inches diameter, 65 per cent. above ground, with a medium neck; flesh fine, cream. Somewhat irregular in size.

CRIMSON TOP TABLE (Carter).—Characters as the last, but with smaller roots which are more above ground and the flesh is of a darker shade. Irregular in shape.

* * *

LAING'S GARDEN (Kelway), C.—An almost spherical rooted variety, with medium lobed leaves, 12 to 14 inches tall; roots $4\frac{1}{2}$ inches diameter, 65 per cent. above ground, with a medium neck; flesh fine, pale yellow.

LAING'S GARDEN (Laing & Mather).—A less regular stock of the last.

GARDEN (R. Veitch).—Characters as 'Laing's Garden.' An irregular stock which contained red-topped turnip rogues.

* * *

GARDEN SELECTED (Dobbie), C.—Roots somewhat longer than broad with large lobed foliage, 16 to 18 inches tall; roots $4\frac{1}{2}$ inches diameter, 60 per cent. above ground, irregular in size; flesh fine, juicy, pale yellow.

EARLY GEM (Cooper-Taber).—A mixed stock of 'Garden' type.

YELLOW GARDEN (Webb).—An irregular stock of 'Garden' type.

* * *

EXCELSIOR (Harrison).—Of 'Garden' type of root, but with a long neck; roots somewhat larger on the whole; flesh pale yellow, very sweet. A true stock.

* * *

AMERICAN PURPLE TOP (Cooper-Taber).—An almost spherical-shaped root, with a long neck; roots 5 inches diameter, 65 per cent. above ground, rough, irregular; flesh cream. Contained green-topped royal.

* * *

PERFECTION PURPLE TOP (Dickson & Robinson), H.C.—A somewhat longer than broad rooted variety with much large lobed foliage, 16 to 18 inches tall; roots $4\frac{1}{2}$ inches diameter, 60 per cent. above ground, regular in size and shape; neck short; flesh deep cream.

PURPLE TOP GARDEN (Gemmell).—Characters as 'Perfection Purple Top,' except that the flesh is pale yellow.

PURPLE (Cullen).—A variety with roots very similar to those of 'Perfection Purple Top,' but rather coarser and not quite true to shape.

NONSUCH (Watkins & Simpson).—Very similar to 'Perfection Purple Top,' but the roots were irregular in size and shape.

* * *

STUDSGAARD PURPLE TOP (Wiboltt).—An almost spherical rooted variety with large lobed leaves, 16 to 18 inches tall; roots 4 inches diameter, 70 per cent. above ground, a dull pale reddish colour at the top; neck of medium length; flesh yellow. Contained green-topped rogue.

* * *

DANISH GIANT (Wiboltt).—A variety with roots deeper than broad, the leaves being 16 to 18 inches tall and lobed; roots $4\frac{1}{2}$ inches diameter, coarse, 60 per cent. above ground; neck long; flesh pale yellow. A field variety.

CELERIAC TRIED AT WISLEY, 1926.

CELERIAC is not grown as much as its merits deserve, possibly because it is not generally recognized that, while it needs a rich soil with both humus and lime, there is no need of the trouble and expense of trench making and earthing up that is necessary for celery, and possibly also because the best varieties are not always selected. Several have rather fangy roots from which much needs to be cut before they are fit for cooking or market, and others have unnecessarily large tops and require more room than better varieties need. The stocks to which awards were given as set out below have none of these drawbacks, and are in addition true regular strains.

Twenty-two stocks were grown in the trial, the seed being sown (after steeping in hydrogen peroxide for two hours to destroy any possible spores of the leaf spot which so often seriously damages this plant and celery) on March 15, and the plants put out on May 11 in rows 18 inches apart, the plants being allowed 12 inches in the rows.

AWARDS, DESCRIPTIONS AND NOTES.

Snowball, A.M. December 2, 1926. Sent by Messrs. Heinemann of Erfurt, Germany.

Giant Ball, A.M. December 2, 1926. Raised and sent by Messrs. Heinemann.

Close Planting, H.C. December 2, 1926. Sent by Messrs. A. Dickson of Newtownards, Co. Down.

LATE SUMMER (Barr).—Described R.H.S. JOURNAL, 48, p. 84.

SNOWBALL (Heinemann), A.M.—Bulb $3\frac{1}{2}$ to 4 inches diameter, smooth, round, solid; rootlets very few; plants 6 to 7 inches tall; foliage compact, decumbent. A very good even stock.

GIANT BALL (Heinemann), A.M.—A variety closely related to 'Snowball,' differing in the root, which is square shaped and on the whole somewhat larger. A very good even stock.

CLOSE PLANTING (A. Dickson), H.C.—Bulb 4 inches diameter, round, smooth, solid; rootlets medium; plants 6 to 7 inches tall; foliage less decumbent than that of 'Snowball.'

APPLE SHAPED (Dawkins).—Described R.H.S. JOURNAL, 48, p. 85.

DELICACY (Dawkins).—Described R.H.S. JOURNAL, 48, p. 85.

GIANT ALABASTER (Heinemann).—Bulb $3\frac{1}{2}$ inches diameter, rough, solid; rootlets many; plants 6 to 10 inches tall; foliage erect; irregular in height.

LARGE ERFURT (R. Veitch, Herb).—Described R.H.S. JOURNAL, 48, p. 84.

TURNIP-ROOTED (W. H. Simpson).—Like 'Large Erfurt.'

EARLY ROUND (Dawkins).—Bulb $4\frac{1}{2}$ inches diameter, rough, solid; rootlets medium; plants 9 to 12 inches tall; foliage spreading and semi-erect.

GIANT PRAGUE (Cooper-Taber, Watkins & Simpson, A. Dickson, Dobbie, Herb).—Described R.H.S. JOURNAL, 48, p. 84.

GIANT SMOOTH PRAGUE (Barr).—Like 'Giant Prague.'

LARGE SMOOTH OR PRAGUE (Dawkins).—Like 'Giant Prague.'

GIANT PRAGUE IMPROVED (Zwaan & van der Molen).—Like 'Giant Prague.'

APPLE SHAPED (Herb).—Like 'Giant Prague'; sent in error.

* * *

EARLY GIANT AUTUMN (A. Dickson).—Bulb $3\frac{1}{2}$ to $3\frac{3}{4}$ inches diameter, rough, coarse; rootlets many; plants 10 to 13 inches tall; foliage spreading; irregular in height.

* * *

PARSLEY LEAVED (J. W. Scarlett).—Bulb $3\frac{1}{2}$ to 4 inches diameter, rough, coarse; rootlets many; plants 6 to 10 inches tall; foliage semi-erect, curled, dark green.

BOOK REVIEWS.

"Manual of Cultivated Trees and Shrubs." By Alfred Rehder. 8vo. xxxvii + 950 pp. (Macmillan, New York, 1927.) 42s. net.

The dedication of this book, which was published in January of this year and is the result of twenty years of laborious botanical work and compilation, is to "Charles Sprague Sargent, LL.D., who during more than fifty years as Director of the Arnold Arboretum has worked with untiring zeal and energy for the promotion of American dendrology and arboriculture." We now grieve that great man's passing, full of years and honours and peerless in the regard of all lovers of trees. This exhaustive publication was the last he was to see from the institution which owed its position in the world, its organization, achievements, and almost its existence to his leadership of over half a century.

Mr. Rehder is to be congratulated on the completion of this important work. His name is distinguished as Professor Sargent's chief assistant in the description of the immense numbers of new species of Wilson's discovery.

The book will be primarily useful in America, where no doubt the next fifty years will see an enormous extension of all branches of horticulture and arboriculture. It is rather surprising to read in the introduction that even now the limit of hardiness in the Eastern States south of the Arnold Arboretum is "imperfectly understood owing to the lack of arboreta and botanic gardens with large collections of woody plants"; it is a misfortune for America at this time of unprecedented botanical discovery that this should be so.

The scope of the book may be judged by the statement that "the trees and shrubs described belong to 468 genera distributed among 112 families. The number of species fully described and represented in the keys is about 2,350, with about 2,465 varieties. Besides these there are 1 family, 30 genera, 1,265 species and 507 hybrids only briefly described or mentioned and appended to the families, genera and species to which they are most closely related, or, in the case of hybrids, to one of the parents."

The main area of the United States has been divided into eight climatic zones, and in the description of species each is ascribed to the zone where it actually is known to be hardy or may be expected to be so.

Unfortunately the map on which these zones are shown is so diminutive— $4 \times 2\frac{1}{4}$ inches—that it is impossible without a magnifying glass to study the zonal lines of demarcation; its usefulness would have been great had it been of a reasonable scale and the zones

distinguished by colours as well as numbers. One of the claims to originality in this book is this attribution of species to their zones.

The labour involved in the production of keys to the groups and species must have been enormous. They are admirably clear; in the case of the difficult genus *Salix* there are, in addition to a general key, two others based on staminate and pistillate specimens and a third on vegetative characters.

The book, including its introduction, synopsis, analytical key to families and aberrant genera, and index, runs to almost 1,000 pages. The information could only be got into that compass by dint of severe abbreviation of authors' names, references, and place names; these, however, are readily recognizable after perusal of the lists of them which precede the letterpress.

In Mr. Rehder's words, his book treats of "all woody plants known to be hardy within an area whose southern limit is an isothermal line connecting points with the mean temperature of the coldest month near the freezing point." This leaves outside it a large south-eastern and southern area of the United States and the whole of the Pacific Coast except the small littoral region of Puget Sound. To readers in this country the value of the book would have been enhanced had it been found possible to include the whole of the States of Washington and Oregon, and California, say, as far south as Monterey, and thus embrace the region to which our own climate most approximates. Doubtless this would have meant a heavy addition to the species described in respect of trees and shrubs from the Southern Hemisphere, few indeed of which appear in the book as possible to be grown in any of the eight zones.

In the case of many important genera the descriptions cover almost all the known species: *Berberis*, *Magnolia*, *Syringa*, *Philadelphus*, most of the *Rosaceae*, and nearly all the *Coniferae* may be cited. In Crataegi Mr. Rehder is commendably frugal, confining himself to 42, including European and Asiatic as well as American species; he very properly says "it would exceed the limits of the book to do more than treat of a few representatives of the different groups." Let us hope that ultimately the portentous enumeration of 800 Eastern American named species may be reduced to approximate Mr. Rehder's number of representatives. In our opinion the author wisely does not make *Pyrus* include *Sorbus* and *Malus*, but treats them as separate genera.

We would have wished him to be more generous with the rhododendrons. He only deals with 62 species, which include 15 natives of America. The majority of the rest are Wilson plants from China, and not one of the hundreds discovered by Farrer, Forrest, and Ward, and described at the Edinburgh Botanic Garden is included, though there are many which by cultivation in this country have proved themselves admirably suited for the milder zones. The author says that more than 400 species of the genus have hitherto been described; the number is over 800. His divisions into subgenera and sections might have been amplified by enumerating the series and phyla into which

it is now customary to divide the bewildering numbers of this enormous and enchanting genus.

As stated above, the Coniferae are exhaustively dealt with, and there are few omissions of such trees as may be seen in any good European pinetum. Mr. Rehder has not been converted by Dallimore and Jackson into reducing the number of Chinese spruces. In the opinion of the latter authors, and their view was adopted in the recent Kew Hand List, *Picea asperata* of Masters includes *P. montigena* and *P. retroflexa* of that authority; they also indicate that they anticipate that this widely distributed Western Chinese species with quadrangular leaves may be found to embrace *P. aurantiaca* of Masters as well as *P. heterolepis* and *P. Meyeri* of Rehder and Wilson; *Picea brachytyla* of Pritzel they believe includes *P. ascendens* of Patscke and *P. Sargentiana* of Rehder and Wilson; also that *Picea likiangensis* of Pritzel includes *P. Balfouriana* of Rehder and Wilson and *P. purpurea* of Masters; and that *Picea Wilsoni* of Masters includes *P. Watsoniana* of Masters. Time alone will show how many of these are species as distinct from mere geographical forms. Mr. Rehder regards all these as true species as they were described in "Plantae Wilsonianae." The dates of introduction to cultivation in Europe or America are given in almost all instances, but unexpectedly omitted in the case of some important long cultivated trees, e.g. *Larix europaea* and *Picea excelsa*, called by Mr. Rehder *Larix decidua* Mill. and *Picea Abies* Kanst. And this induces a criticism with which few growers of trees on this side the Atlantic will disagree. In the case of species widely and universally known under established names it is surely didactic and somewhat absurd virtually to rename them in order to comply with a religious adherence to the Vienna Rule. It is vexatious to see *Ulmus campestris* called *U. procera*, *Cedrus Libani* called *C. libanotica*, *Abies Webbia* called *A. spectabilis*, *Abies pectinata* called *A. alba*, thus confusing it with *Picea alba*, *Larix leptolepis* called *L. Kaempferi*, causing it to be confounded with *Pseudolarix Kaempferi*, which in turn is called *P. amabilis*. Indeed the absurdity is most apparent when we find *Larix* \times *europolepis* Henry described as *L. Kaempferi* \times *L. decidua*! The general rule that the oldest name should have priority is sound, but American botanists will never be followed in this country in the adoption of names unknown to all but the very few for familiar trees.

Proof-reading must have been done with the utmost care, as we have been unable to detect a misprint or mistake, unless it be in the cryptic sentence on page xiv of the Introduction, where, referring to the eight climatic zones, they are described as "characterized by a difference of from 5 to 5 degrees in the lowest mean temperature of the coldest month." By this presumably is meant from 1 to 5 degrees. On the same page the author truly says that "as a rule one may say that plants stand cold better in a drier situation than in a wet one and that deciduous trees and shrubs prove hardier in a more exposed situation and in a climate with higher summer temperature, while evergreen plants prefer a sheltered situation and like a more humid

climate and less extreme summer and winter temperatures. For this reason many deciduous species grow best in the East, while evergreen plants and particularly broad-leaved evergreens will do better on the Pacific Coast." He might also have made mention of the fact that what kills the hardiest of European and Pacific Coast evergreens in the region of the Arnold Arboretum is drought in spring, when the warm suns cause rapid evaporation of moisture from leaves which cannot be replaced while the roots are in ground still hard frozen. This is surely the reason why such absolutely frost-proof plants with us as ivy, common yew, *Rhododendron ponticum*, Lawson cypress, and the Douglas fir of the Pacific Coast cannot survive at the Arnold Arboretum. Who can explain, however, why native evergreens of New England like *Rhododendron maximum*, *Epigaea repens*, and *Kalmia latifolia* do not suffer from the same cause?

"Ways of Living: Nature and Man." By J. A. Thomson. 8vo. vii + 246 pp. (Hodder & Stoughton, London, 1926.) 3s. 6d. net.

This little volume contains lectures on the ways of life of many different creatures by five members of the University of Aberdeen and a final chapter summarizing the whole by Prof. Patrick Geddes. A very readable, suggestive and informative volume has been produced. To it Prof. J. A. Thomson contributed two lectures, "Each for himself" and "Social Animals"; Dr. Macgregor Skene two, on "Individualistic Plants" and "Parasitic Plants"; Dr. Rennie one on "Parasitic Animals"; Dr. A. S. Watt one on "Communities and Partnerships among Animals"; and Dr. Robt. D. Lockhart one on "Man and Nature."

"Vegetables for Home and Exhibition." By E. Beckett, V.M.H. 8vo. 420 pp. (Simpkin, Marshall, London, 1927.) 15s.

An excellent account of vegetable cultivation by an acknowledged master of the art, full of information, and written clearly. Each vegetable is dealt with in order, and in addition there are chapters on cultivation, management, seed raising, exhibiting, judging, insect pests, and diseases, and a compendious calendar.

We do not concur in all that is advised, but the points of difference are not many. For example, we think hydrogen peroxide a better disinfectant against the leaf spot disease of celery than formalin; it is not wise in all circumstances to bring the subsoil to the surface.

It should be clearly understood that we have here a book devised and suited for instruction in vegetable cultivation in private gardens, not for market gardening.

"A Garden in Wales." By A. T. Johnson. 324 pp. 8vo. (Edward Arnold, London, 1927.) 16s. net.

This volume gives an account of what is evidently a very attractive garden in North Wales. The author is a well-known horticultural enthusiast and writer, and one, moreover, who really knows his plants and endeavours to grow all that is best. The book is arranged in a somewhat unusual manner and written throughout in a flowing, conversational style. Its arrangement may be gathered from the headings of some of the chapters, e.g., By a Woodland Water-side; The Hardy Heaths; On Certain Early-Flowering Shrubs; Notes in the Month of Roses; Another Mixed Bag; Our Rock Garden; Oddities and Rarities; Ways and Means. Although the author has not been chary in the use of matter which is not strictly horticultural, the book contains a vast amount of useful information, culled in many cases from the writings of the best gardeners of the day, and it forms one of the best and most accurate works of its kind.

"The Field Club Flora of the Lothians." Edit. by I. H. Martin. viii + 143 pp. 12mo. (Blackwood, Edinburgh, 1927.) 5s. net.

This is a list of plants occurring wild in the Lothians, compiled by a Committee, following the London Catalogue in nomenclature and order, giving localities by parishes, habitats and usually an English name. Presumably wild plants have no local names in this part of Scotland, with the exception of the Gean, or else surely they would have taken precedence of the English!

The last forty pages are occupied by an illustrated glossary, and a map of the district completes a handy little volume.

There are a few lists under the general title "Ecological Lists," which is rather a misnomer, for the sub-titles are such as "Arthur's Seat and Crags," "Bass Rock," and so on, and the lists are therefore very local floras.

The value of the book lies largely in telling the visitor to the district what he may expect in the way of wild flowers.

"The New Dictionary of Gardening." By J. W. Morton. 155 pp. 8vo. (Foulsham, London [1927].) 2s. net.

It is claimed that this is the only gardening dictionary which separates Flowers from Shrubs and Fruits from Vegetables. We should have thought this a needless handicap in an alphabetical arrangement. References occur sometimes under the Latin name, sometimes under a vernacular name, and cross references frequently occur. The relative value of a genus cannot, we fear, be gauged by the space the reference occupies. *Puschkinia* comes in for nine lines, for instance, *Osmunda* for 3½, Orach (among flowers) for 4½, *Hymenophyllum* for 6, and so on. *Caragana* is mentioned among the trees. Savin is given as equivalent to *Juniperus*. Larch we are told *are* propagated by seed, cuttings, grafting or layering. But we need not quote further.

"Farrer's Last Journey in Upper Burmah, 1919-20." By E. H. M. Cox. 8vo. 244 pp. (Dulau, London, 1926.) 18s. net.

Although deprived of what one must suppose would have been a prolific source of information—Farrer's own diaries—Mr. Cox has succeeded in producing a most valuable account of his last journey in the years 1919 and 1920, and incidentally an interesting sketch of a very remarkable personality.

That Farrer's name will always hold a high place among the plant collectors of his time cannot be doubted. The number of his introductions, considering that they are the result of only two seasons, was not inconsiderable, and several of them have won an enduring place in our gardens, to mention only the glorious *Gentian* which bears his name. We entertain some doubt whether *Viburnum fragrans*, which he praised so highly, the introduction of which Mr. Cox attributes to him, was not sent home some years earlier by Purdom, though unrecognized at the time. On this point, however, we are not in a position to speak with certainty. It is interesting, too, to note that Mr. Cox claims for Farrer the reintroduction of *Berberis Wallichiana* (presumably of de Candolle), concerning which there has been much confusion in gardens. We find it difficult, however, to reconcile the description of the plant given in the book with that of de Candolle. Possibly it is a variety of the Nepal species. A detailed list of *Rhododendrons* found by Farrer is supplied by Miss Helen Maxwell of the Edinburgh Botanic Garden, which will be most useful. From this it appears that Farrer sent home material or seeds of approximately 100 species from N.W. Burma—of these 21 were new. Farrer's introductions are sufficient to show that he was an exceptionally keen observer, an indefatigable worker, and fastidious in a high degree in his tastes.

But after laying down the book we fancy most readers will be left pondering more over the man than over his achievements. To all appearance ill-equipped physically for the tasks he set himself, he faced the attendant discomfort and dangers with a courage and persistence which win our unstinted admiration. It may be that his wayward disposition unnecessarily multiplied his own difficulties—he was indeed easily upset. On one occasion when some of Forrest's collectors appeared unexpectedly in what he considered his sphere of influence "he spent hours stamping up and down with his hands firmly clasped behind his back," though it was explained to him that the visitors had no intention whatever of poaching on his preserves and had only come to see how he was getting on. These little storms passed off, and in spite of them he must have been endowed with qualities which engendered loyalty and affection, for he manifestly won the regard of those who served him and nursed him so devotedly in his last illness. Added to this is the testimony of Mr. Cox himself, who came through a year, in circumstances as testing as it is possible for two human beings to subject themselves, "with flying colours and with friendship unimpaired." That is enough.

It is fortunate for us that this strangely versatile being—author, painter, traveller, collector, and Buddhist to boot—with his moods and his foibles, his ecstatic style and his adventurous spirit, should have had so capable and sympathetic a friend to immortalize the journey, which ended, alas! so tragically.

"Sunt lacrymæ rerum et mentem mortalia tangunt."

"Alpine Flora for Tourists and Amateur Botanists: with text descriptive of the most widely distributed and attractive alpine plants." By J. Hoffman. Translated by E. S. Barton. New ed. xiv + 121 pp.; 43 col. pl. 8vo. (Longmans, London, 1925.) 12s. 6d. net.

This companion for the wanderer in the European Alps who desires to know the names of the plants that attract attention is well known and deserves to be even better known, for it is an easy guide by its well-drawn coloured plates, each with several figures, and its plain and easy descriptions. Everyone who goes to the Alps in flower time, and who does not aspire to a critical knowledge of their flora, but is content with such general information as a popular book can give, should take this with him and employ it.

"The Riddle of the Tsangpo Gorges." By Capt. F. Kingdon Ward. xv + 328 pp. (Arnold, London, 1926.) 21s. net.

This book might well have borne a double title, for it not only deals with the riddle of the Tsangpo Gorges but with the riddle of the Himalayan-Chinese flora. Towards the solution of both these problems it is an interesting and valuable contribution. Capt. Ward has still further reduced the unexplored portion of the course of the river which was so long a mystery, and has made it practically certain that no great falls exist in those well-nigh inaccessible ravines. The "omne ignotum pro magnifico" has, it seems, been swept aside. He has also thrown more light on the connexion between the floras of Western China and the Himalayas.

The region was very little known; Major Bailey and Major Morshead passed through it on their journey from China to India in 1913, but their opportunities for plant collecting were limited, and though Capt. Ward's geographical achievement was not inconsiderable, it was for plants that the expedition was undertaken. It is therefore gratifying to learn that seeds of some 250 species were sent home, largely *Primulas*, *Meconopsis*, and *Rhododendrons*; and apart from the merits of any new discoveries, their affinity with contiguous floras will be studied by botanists with care. For the horticulturist one has only to mention such chapter headings as "The Paradise of *Primulas*," and "In the *Rhododendron* Fairyland" to ensure their turning to them with eagerness. Their appetite will be further whetted by descriptions of groves of "weeping pines" 150 feet high, a *Magnolia* with leaves 20 inches long and 10 inches broad, which stands 30 to 40 feet high, and junipers which reach a height of 200 feet. For the names of these we must bear our souls in patience, and thank Capt. Ward and his companion for having once more faced the hardships and perils of travel in little-known regions for the benefit of our woods and our gardens.

Lord Cawdor was evidently an energetic and inspiring fellow traveller; his bent is ethnology, and the two fascinating chapters which he contributes on the manners and customs of the tribes of South-East Tibet have only one fault—they are too short. Lord Cawdor need not have apologized for what he modestly terms "haphazard notes"; they will, we believe, be found not the least instructive chapters of an interesting book.

The photographs are excellent and the map helpful, and would have been more so to the reader endeavouring to follow the journey if the route had been marked in red, with a few arrows to assist, more especially as the narrative is not quite consecutive.

"A Botanist in the Amazon Valley. An account of the Flora and Fauna in the Land of Floods." By R. Ruggles Gates, B.Sc., Ph.D. With Photographs and a Map. 8vo. Pp. 203. (H. F. & G. Witherby, London, 1927.) 7s. 6d. net.

This attractively got up book gives a simple yet thoroughly reliable account of the great valley of the Amazons river so far as the author travelled along it. The interest of this book is mainly botanical, but Dr. Gates includes in his brief survey some details of the population, both the native Indian and the half-caste Brazilian, a population very thinly scattered in small clearings along the banks of the river and its tributaries. Animal life is described, mostly, it may be said, in the way of the too numerous and noxious insect pests which beset the traveller.

The great variety and the wonderful beauty of the Palms, especially in the lower reaches of the Amazons, cannot fail to delight the fortunate voyager; they are indeed an outstanding feature of the riverine vegetation. The eye and mind are almost oppressed by the immense number of other tree forms, and the author does not fail to realize the difficulties in the way of botanical exploration and the identification of forest trees in the huge "Matto," owing largely to the almost permanently inundated condition of the riverside forest. It is indeed

due to this serious impediment that the utilization and development of the incalculable resources of the timber and its many products are not, and for a long period will not be, a paying proposition either for the Government of the Brazilian Republic or for private enterprise. As A. R. Wallace, in his "Travels on the Amazon," truly remarked, "The forests of the Amazon are distinguished from those of most other countries by the great variety of species of trees composing them," and many are yet unknown and undetermined.

Of special interest is Dr. Gates' account of his sojourn at Teffé, which, under the name of Ega, was for several years the headquarters of H. W. Bates, author of the classic on equatorial life, "A Naturalist on the Amazons." The little town is situated on a river of the same name which enters the upper part of the Amazons known as the Solimões river; and there, as Bates wrote on his arrival, "A few days' experience of the people and forests of the vicinity showed me that I might lay myself out for a long, pleasant and busy residence there." And there Dr. Gates found unending interest in exploring the "Ygapo" or submerged forest, in company with a *caboclo* or half-breed canoe-man, fresh plants greeting him at every turn, from the giant *Victoria Regia* to the small submerged *Utricularia*; and the reader will enjoy accompanying him on these excursions. But when he writes of seeing there the "long-tailed" red Araras or *parrots*, he really means *macaús*. Dr. Gates refers to the undermined banks with great trees standing precariously on the edge: when near Santarem the reviewer saw a forest giant fall over into the water with a resounding splash.

The author's photographs are particularly charming and illustrate faithfully the river scenes and vegetation; the frontispiece is delightful, with its telling reflections, which are only too seldom to be seen on the water, as there is usually some ripple or movement.

A slight error is noticeable in the description, on p. 45, of the great river Tocantins (which joins the Amazons near Pará); it is described as running *southwards*, whereas it rises in Southern Brazil and traverses the Matto Grosso in a northerly direction.

"My Town Garden." By Lady Seton. 8vo. xiv + 223 pp. (Nisbet, London, 1927.) 6s. net.

The writer of this notice would be proud to reckon this book to his credit, for out of ripe experience, good taste, knowledge, and common sense it has been written, and with a nice appreciation of the needs of the ignorant but enthusiastic lover of a garden whose surroundings are circumscribed and means moderate. It may be counted a safe and trustworthy guide to good practice in little town gardens, and the owners of even larger gardens might often consult it with advantage and pleasure to all their visitors.

"The Gardens of Good Hope." By Marion Cran. 8vo. 326 pp. (Herbert Jenkins, London, 1926.) 10s. 6d. net.

This volume of vivacious chatter comes from the pen of a ready writer indeed. So ready that the reader is whirled from a stout missel-thrush to cinemas and the top of an omnibus, and so on, till he finds himself reading about many folk who live in South Africa, their dogs and their goats, with an occasional allusion to their gardens and the plants they grow. But we are not allowed to stay there; the mention of an *Echium* causes us to be rushed back to Wisley, and a review of the behaviour of *Boraginaceae* in general in English gardens. To turn to the index and hunt out promising flower names should lead us straight. However, 'Kapokbloem' lands us in a sentence telling of "a white flower which I thought was Kapokbloem, but that I believe flowers in summer, so it must have been something else." Of course the reader who is not annoyed by such rapid changes of subject will find somewhat the same charm in this book as there is in reading the unconnected definitions of a dictionary.

For those longing to learn about South African gardens it is simply tantalizing. For example, as soon as we find out that roses grow well under the Southern Cross, we are switched off to wounded soldiers and the draughts, rabbits, and green fly of this kaleidoscopic writer's English home.

"The Fruit Garden." By A. J. Macself. 8vo. 222 pp. (Thornton Butterworth, Ltd., London, 1926.) 6s. net.

In this little book—No. 12 of the "Home Garden" series—Mr. Macself deals with his subject in a thorough and entertaining manner that throughout will hold the reader's interest, whatever his experience or inexperience in matters of fruit cultivation.

In early chapters the importance of a judicious selection of kinds of fruit, forms of training, etc., in order to obtain pleasing effect and profitable results in gardens of varying size and character, is emphasized. These notes are of a particularly helpful nature and merit the careful study of every intending planter. Separate chapters are then devoted to each kind of fruit, and advice tendered regarding cultural treatment required by each is generally sound and complete, always helpful.

Occasionally instruction upon all-important duties lacks the simple, practical detail necessary to guide the tyro, or to satisfy embarrassed amateurs searching for advice upon how to overcome the numerous difficulties and problems likely to confront them. Yet in a book of this size, which deals with all kinds of hardy fruit worth growing in the garden, it is obviously impossible to do more than set out the more essential points to be observed. On this score most readers will turn away completely satisfied.

But few outstanding garden varieties of fruits are omitted from the long—often too long—lists of varieties, and the fact that 'Conference,' perhaps the most generally satisfactory of all garden pears, is missing from the list of pears recommended must be regarded as a regrettable oversight rather than intentional.

It is a little surprising to find the author definitely advising gardeners *not* to prune trees in the season of planting. Circumstances, such as the age of the trees, time of planting, etc., must ever have bearing upon this post-planting attention, and whilst pruning after planting generally gives good results no hard and fast rule applies.

In a sub-chapter the author sets out to explain the terms "self-fertile" and "self-sterile" as applied to apples. Only in a half-hearted manner, apparently, does he recognize the general need for cross-pollination of apple flowers—also pears and plums and cherries—and no mention at all is made, here or elsewhere, that many pears are self-sterile or that, in the case of plums and of cherries, certain varieties are inter-sterile, facts that must influence the successful planter's selection of varieties.

The chapters relating to Small Fruits contain a great amount of really helpful advice. It is curious to read on page 130, however, where the merits and demerits of black currant varieties are discussed, that "the chief attraction of 'Baldwin' is that it ripens very early, making it . . . valuable for cold northern districts where the late varieties do not always get a fair chance to ripen." 'Baldwin'—the true stock—though one of the earliest to flower, is actually among the last to ripen its berries.

The commoner diseases and pests that attack garden trees and bushes are described, and in most cases suitable remedial measures suggested. In the note on American Gooseberry Mildew, however, nothing is said of the efficacy of summer spraying or of the virtue of "tipping" the bushes in late summer, as measures of control. It is also to be pointed out in connexion with this disease that, contrary to the author's account, the Ministry of Agriculture does *not* insist upon the immediate destruction of all bushes infected with this disease.

A chapter is devoted to the care of the greenhouse vine, and under Miscellaneous Fruits is detailed the management of fig, medlar, mulberry, quince, and nut trees.

There is also included an account of how trees and bushes may be propagated.

The many illustrations—four coloured and nine half-tone plates and twenty line drawings—are good, and add greatly to the value of the book, which is well printed, fully indexed, and can be recommended as likely to interest and help the amateur gardener and stimulate the growing of fruit in home gardens generally.

"Winter Blossoms from the Outdoor Garden." By A. W. Darnell. 8vo. 366 pp. 8 coloured and 16 plain illustrations. (L. Reeve & Co., London, 1926.) £1 1s.

There is so much to praise in this book that it is unfortunate it contains so many inaccuracies.

On the credit side stands its excellent object, which is to induce the gardeners of Great Britain to grow many little-known plants which will flower in the months of December, January and February. On the other hand, in spite of the limitation to these three months on the title page, the writer takes a far wider view of winter, and includes many plants, such as *Magnolia conspicua*, *M. salicifolia*, *Atragene*, and *Gentiana Farreri*.

It seems unlikely that even in the mildest of winters and the most sheltered of coastal gardens these plants would give good flowers between November and March.

Many good new plants are mentioned, for instance *Prunus Conradinae*, *Forsythia ovata*, and *Viburnum fragrans*, but is there any one now alive who saw the long lost *Galanthus Elsau*, or the purely imaginary "good forms" of *Crocus banaticus* referred to as *albiflorus*, *concolor*, *niveus*, *victus*, and *versicolor*?

The synonyms given after the name accepted by the writer are useful, but it is startling to find the Rutaceous genus *Xanthoxylon* quoted as a synonym of the Ranunculaceous *Zanthorhiza*. Aiton's name *Spartinum virgatum* is chosen for *Genista virgata* Link. The writer professes to follow the nomenclature of the Index Kewensis, but has disregarded it in this instance. Moreover, he must have some other plant in mind, possibly *Cytisus racemosus*, for *G. virgata* is perfectly hardy and never flowers earlier than June, instead of needing a warm wall and flowering in February as stated here. Darwin's Barberry is mentioned as though it were the same plant as *Berberis buxifolia*. *Hepatica triloba* is evidently the species dealt with as *H. angulosa*. *Prunus microlepis* is described separately from *P. subhirtella* var. *autumnalis* though one and the same. *Colchicum crociflorum* is not a variety of *C. autumnale*.

It looks as though the author has been too optimistic in believing in records of the occasional winter flowering of certain plants, and that his voluminous notes mentioned in the Introduction have not been verified by personal observations with living plants.

Of the evergreen *Iris unguicularis* we are told that it should be ripened off by having handlights placed over the clumps as soon as the leaves die down!

With such an excellent subject for a useful book of moderate size and price, it seems a pity that the inclusion of such crude coloured plates and of so many doubtfully hardy and reliable plants should have resulted in so pretentious a volume.

"An Easy Guide to Gardening." By H. H. Thomas. 8vo. 184 pp. (Cassell & Co., London, 1927.) 2s. 6d. net.

This book is one of a series of Gardening Handbooks, written in a clear and concise style, dealing with practically all phases of gardening, such as planning, soils, manures, seed sowing, lawns, herbaceous borders, popular and old-fashioned flowers, vegetables, fruit, and the amateur's greenhouse.

There are upwards of forty illustrations, all very clear and helpful to a beginner.

Necessarily in such a small book the descriptions of plants and operations are very short, but nevertheless accurate.

The fruit garden and orchard are disposed of in six pages, vegetables in ten pages, whilst manures and fertilizers occupy three pages.

"500 Popular Flowers and How to Grow Them." By H. H. Thomas. 8vo. 184 pp. (Cassell & Co., London, 1927.) 2s. 6d. net.

In this volume the most popular genera of flowering plants are set out with brief descriptions in alphabetical order. Very few species or garden varieties are mentioned under the various genera.

The information given is reliable and the many illustrations are very good.

The use of an initial capital letter for many of the species, even when used as sub-headings, looks unfamiliar, e.g. page 38, *Cannabis Sativa*, and page 47, *Cobaea Scandens* (and many others), are given capital letters to the species, whereas on page 33 *Bulbocodium vernum* is correct with a small 'v.'

But this is of little account to the owner of a small garden.

"Rock Gardening for Beginners." By H. H. Thomas. 8vo. 184 pp. (Cassell & Co., London, 1927.) 2s. 6d. net.

This book, like the others of this series, is well got up; the paper, printing, and illustrations are good.

Many valuable hints on making a Rock Garden, together with lists of suitable plants for various positions and aspects, are given.

The Moraine, the Bog Garden, and alpine flowers for the unheated greenhouse are also dealt with in a clear and concise manner.

The various lists of plant names are remarkably free from errors in spelling. The rendering of *Linnaea Borea Alis* for *Linnaea borealis*, p. 136, and *Amagydalus nanus* for *Amygdalus nana*, p. 168, are surely printer's errors. *Houstonia Coerulea*, p. 135, and a few examples of names used as sub-headings are given with initial capitals to the specific names instead of small letters.

"Sweet Peas for Amateurs." By Norman Lambert and H. H. Thomas. 8vo. 183 pp. (Cassell & Co., London, 1927.) 2s. 6d. net.

This is a very comprehensive guide to the cultivation of these popular plants. Soil preparation, sowing, planting, tying, and treatment for the various pests are dealt with in a very clear manner.

Lists and descriptions of the leading varieties are also given.

The many illustrations are also of great value to the beginner.

"Home-Grown Vegetables." By H. H. Thomas. 8vo. 184 pp. (Cassell & Co., London, 1927.) 2s. 6d. net.

This book, dealing as it does with one branch only of gardening, contains very full details of soils, manures, pests, and general culture of all the ordinary vegetables.

The various operations to be performed are elucidated by means of several good diagrams.

"Pruning Made Easy." By H. H. Thomas. 8vo. 184 pp. (Cassell & Co., London, 1927.) 2s. 6d. net.

In this small volume the author sets out to instruct the amateur upon the proper pruning of his rose trees, fruit trees—including the vine—and ornamental trees and shrubs.

The principles that underlie correct pruning—without a knowledge of which no pruner may succeed—are explained in clear and simple manner and, along with a wealth of practical detail, provide the beginner with an excellent guide to the methods to adopt with most trees, bushes, and shrubs likely to be grown in the amateur's garden.

The eight full-page plates, from photographs, are decorative and the numerous line drawings mostly helpful to the reader. A few of the drawings, however, appear to have been crammed into the book regardless of their usefulness, and not always do they accurately picture treatment recommended elsewhere in the book.

For example, with the illustration of summer pruning apples and pears on page 86 it is stated that "should sub-laterals form (following the pruning) leave them to be dealt with at the winter pruning"; whereas on page 113 it is made clear in drawing and text that sub-laterals should be pinched back to one leaf as often as produced—sound advice corroborated on page 96.

As an example of redundancy, there are the four separate drawings illustrating the pruned black currant bush, all showing much the same thing, on pages 113, 126, 138, 139. In such a small book this seems unwarrantable—though, possibly, repetition of this kind may help to secure proper treatment for a fruit so very frequently maltreated by the pruner.

Experienced gardeners will disagree with the diagram on page 138, which illustrates "how to prune one-year-old black currant bush," the general and best practice being to cut back the one-year-old plant to within two or perhaps three buds of the ground.

On page 120 the author states, incorrectly, that the 'Persnore' plum is a variety very susceptible to silver leaf disease. It is correct to attribute this failing to 'Victoria,' but 'Persnore' shows remarkable resistance to the disease.

In an Appendix at the end are lists of trees and shrubs, alphabetically arranged, showing those to prune in winter, in spring, and in summer, with abbreviated notes upon the pruning of each kind; easily accessible information that adds considerably to the usefulness of the book.

"My Garden comes of Age." By Julia H. Cummins. 8vo. 180 pp. (Macmillan, New York and London, 1926.) 12s. 6d. net.

"My Garden comes of Age" has presumably been written for the interest and amusement of its owner and not with the idea of teaching the public much. Still, it is just as readable as fifty other books written by ladies about their gardens.

What we must admire is the author's courage in making a garden at all in the Adirondacks, where, she tells us, it is under snow from November to mid-April, unless swept bare by the wind, that the thermometer is liable to drop from 20° above zero to 45° below zero in a few minutes, and that it is unusual to escape a severe frost in the middle of June, and another in the middle of September. This makes gardening difficult with a vengeance; but the summers are warm and the soil light, and it is possible to grow all the best hardy summer flowers,

which she describes admirably, and one is astonished at the number and variety of choice things grown in this garden.

She gives sound advice to anyone about to start a garden, especially when she says "If you wish the place to express your own individuality, lay it out yourself rather than employ a garden-architect." She was later on strong-minded enough to resist the blandishments of a landscape architect who wished to alter much of what she had laid out herself.

Another bit of good advice is to grow the majority of your plants from seed, perennials as well as annuals. Her herbaceous border, her hopes, aspirations, and disillusionments are well described, and one can see that in spite of "rose bug" and other disabilities she loves her garden, and quickly learns in such a climate to discriminate between what she can and what she cannot grow, and that every locality has its limitations and to ignore them is to waste much time and money.

The book is worthy of better illustrations.

"The Growth of Biology: Zoology from Aristotle to Cuvier; Botany from Theophrastus to Hofmeister, Physiology from Harvey to Claude Bernard." By the late William A[ibert] Lacy, Ph.D., Sc.D. 8vo. 481 pp. (Bell, London, 1925.) 16s. net.

The author of this attractive volume lived to complete the manuscript but not to see it through the press, consequently the final touches have been missed, and may account for some of the errors mentioned below. From the Greeks the author passes through Roman times, with Pliny the compiler and Dioscorides the writer on *materia medica*, to the Arab physicians Avicenna and Averroes, eulogizing Galen, till the dawn of modern science in the thirteenth century. The Herbals are discussed, including in them such volumes as those of Mattioli, Caspar Bauhin, and Cesalpino. The chapter which follows is headed "Vesalius and the overthrow of authority in science," passing on to William Harvey, and then "Primitive microscopes and the discovery of micro-organisms" brings one naturally to Leuwenhoeck, Grew, Malpighi, Swammerdam, Lyonnnet and more recent observers, the author incidentally pointing out that Grew was before Malpighi in certain observations, and consequently could not "have plagiarized from him."

It may be noted here that strict chronological arrangement is not kept, as from this point the author goes back to Conrad Gesner, whose methods are praised as giving a new departure in zoology. Ray and Willoughby are next dwelt upon, and Ray's conception of a species is praised as the first introduced into natural history. Next follows Linnaeus, afterwards von Linné, but as the author is a zoologist he has relied too much on Sachs's history of botany, and has even gone beyond that author's biased views. Sachs was neither a systematist nor a zoologist, and his judgments of Linné are unfair; he denies him to have any merit in botany, except as arranger and describer, when these two departments were the need of the moment, to sort plants into their proper genera, in the hope that ere long, enough might be got together to set up some natural arrangement. Linné was trying to do this all his life, but left it for later workers to achieve. Again, Linné had to teach some chemistry, semiotics (a branch of pathology) and *materia medica*. We may here notice the unfortunate blunders concerning the career of the distinguished Swedish professor. His grandfather's name was Ingemarsson, not Ignemarsen; Linné did not spend a month in Harderswijch, but seventeen days; he did not stay in Sweden by reason of his wife's persuasion, for he had gained a good position before he married; more might be adduced, but it will be enough to give one instance to show Sachs's animus against Linné. Speaking of Caspar Bauhin (1560-1624), our author says: "In the 'Pinax' he gives about six thousand plant names. As a predecessor of Linnaeus, he is noteworthy for supplying all plants with two names and thereby marking a distinction between species and genus. 'Every plant has with him a generic and a specific name, and this binary nomenclature which Linnaeus is usually thought to have founded is almost perfectly maintained by Bauhin, especially in the 'Pinax'; it is true that a third and fourth word is not infrequently appended to the second, the specific name, but this additional word is only an auxiliary' (Sachs)." (p. 361).

The reviewer, as a user of Bauhin's "Pinax" for more than half a century, and knowing the true state of the matter, took a random twenty pages of the work in question (pp. 308-328), and counted the names of the species, ranging them from one to many words as the specific name, and this is the result: in one word 4; two words, 45; in three words 69, in more than three words 118, in sum, binomials 45; polynomials 187, so that binomials are less than one-fourth

of the entire number—so much for Sachs's accuracy! Linné was the first to apply what he termed "trivial" names throughout, but he owned that others had done so to some extent before him. Any student of the "Amoenstater academical" knows that Linné treated of teratology, sexes of plants, buds, hybrids, the night-position of plants, opening and closing of flowers, time of leafing and "germs" as the cause of diseases, naturally fettered by the comparatively little knowledge of these subjects at the time when he taught.

The name Busbecq is misspelled "Dusbecq" three times on p. 147.

"An Outline of Plant Geography." By Douglas Houghton Campbell. 8vo. pp. xi + 392. (Macmillan, London, 1926.) 17s. net.

Professor Campbell has travelled widely during the last thirty years, and has here recorded his recollections, aided by the statements of other writers. Beginning with a short account of facts concerning distribution in geological times from fossil plants, he discusses climatic zones—the arctic, boreal, temperate, and tropical regions, dividing the last into palaeotropics, the tropics of the old world, and neotropics, those of America. Many authorities are quoted, but there is no bibliography appended; nevertheless the book is eminently readable, and the abundant illustrations exemplify the author's statements. Unfortunately the botanical names are carelessly printed, sometimes in italic type, but often in roman; botanists will be shocked at the disregard of botanical propriety and usage, by the capitals used in local names, as *Americanus*, *Canadensis*, *Virginiana*, and the like, with the use of lower-case letters in such names as *Cinnamomum camphora*, *Dracaena draco*, *Pittosporum tobira*, and *Quercus cerris*. A few printer's errors are to be noted, as "Oxytropia" for *Oxytropis*, "Soldinetta" for *Soldanella*, whilst *Cedrela Toona* is printed *Cedreal toona*. The statement that *Cinchona succirubra* is a "most valuable species" (p. 284) is not borne out by the authoritative statements of the Dutch responsible for the plantations. It is a rapid grower, but nowadays little valued; far and away the best species is *Cinchona Ledgeriana*, with hybrids between that and *C. Calisaya* and *C. succirubra*.

"Das Dahlienbuch." Herausgegeben von Karl Foerstan und Camillo Schneider. 4to. pp. 103; col. figs. 13; black figs. 67. (Verlag der Gartenschönheit, Berlin, 1927.) M. 8.

The publisher in his address, states that no German treatise on the Dahlia has hitherto been published, and this, which ranks as the fifth volume of the "Gartenschönheit" [Garden Beauty] is to supply the vacancy. Beginning with the history of the Dahlia, with reproduction of illustrations from such early writers as Hernandez, 1575, Cavanilles, 1791-1794, Willdenow, 1809, etc., it describes the single type, the partially double, and the double types, cactus, and other forms. Then follows a list of florists' varieties, German growers, application to small and large gardens and parks, culture and propagation, pests and diseases, winding up with a catalogue under the various forms and colours, and a bibliography is appended.

"Commercial Strawberry Culture." By J. W. Morton. 48 pp. (Ernest Benn, Ltd., London.) Price 2s. 6d.

This book contains a great deal of practical detail that should prove helpful to growers, particularly to beginners, but not always do the methods advised follow generally approved practices. The two line drawings are neither instructive nor decorative.

"Commercial Cucumber Culture." By the Lea Valley Correspondent of *The Fruit-Grower*. 46 pp. (Ernest Benn, Ltd., London.) Price 2s. 6d. net.

A companion volume to "Commercial Tomato Culture," this little book details in a thorough manner the cultivation of cucumbers for market. The author is fully alive to the fact that we have travelled far from the period when cucumbers were looked upon merely as a profitable "catch-crop." Cucumber culture is now the principal concern of many big establishments that are worked on similar lines to factories. This book is certainly packed with much helpful information upon the methods adopted by our most successful cucumber growers, and can be recommended to the beginner as well as to the established grower who wishes to keep abreast of the times with his methods of cultivation, disease control, etc., and with the organization and management of his business.

"Commercial Tomato Culture." By the Lea Valley Correspondent of *The Fruit-Grower*. 48 pp. (Ernest Benn, Ltd., London.) Price 2s. 6d. net.

The author of this little book deals with his subject in an essentially practical manner, his aim, he states, being to help those already in the tomato-growing industry as well as beginners who are building, or thinking of building, tomato houses, by giving some general idea of the methods practised by the Lea Valley growers. Emphasis is laid upon the importance of judicious watering of the plants throughout their life and correct ventilating of the houses, also upon the need for care in the use of artificial manures, to the misuse of which the author ascribes the financial failure of many young growers. Wisely, perhaps, the writer offers no specific guidance in the control of the prevalent mosaic disease, or attacks by red spider, but points out that "the object of every grower must be to get healthy, strong, and vigorous plants, when 'growing' is easy."

The practical and clearly expressed detail which explains almost every operation involved makes this book worthy of study by all interested in the growing of tomatoes for market.

"Conifers, Junipers and Yew." By John Davidson. 37 Plates. 72 pp. (Ernest Benn, Ltd., London.) 21s. net.

This is the first of a series of books to be issued annually under the title of "The Illustrated Botany of British Columbia." The text is by Prof. Davidson of the University of British Columbia, and the illustrations by Ivy Abercrombie. The object of the series is to give a concise account of the flora of British Columbia, together with an illustration of each genus—usually in colour—and a description of each species. The present volume covers the conifers found in British Columbia, twenty-three in number, with notes on their distribution and economic importance, and no pains have been spared to determine the distribution of species and to verify existing records, and as a result it is interesting to note that so far no evidence has been found to justify the inclusion of *Juniperus occidentalis* and *J. horizontalis*, although several floras have recorded them.

In nomenclature the author follows the rules of the International Congress of Botanists, for which there is much to be said, although the name *Pseudotsuga taxifolia* for the Douglas Fir sounds strange to one's ears.

The author does not agree that there are any varieties of the Douglas Fir. Variations from the type he attributes to the particular habitat of individual trees and the difference in colour to environment.

With regard to *Pinus contorta* Douglas he is of opinion that the so-called var. *Murrayana* Englm. syn. *P. Murrayana* Balf. is neither a sub-species nor a variety, but simply an environmental form. One would more readily accept his conclusions in the matter if he did not adduce as conclusive evidence the behaviour of two young trees, one of each type, which after ten years' growth were identical in every respect. Bean separates the species and the variety mainly on account of their distinctness in cultivation, and that certainly has been our experience of them.

In describing the two Tsugas it is curious that no mention is made of the most interesting natural hybrids that have occurred between the species, one of which, described by Henry under the name of *Ts. Pattoniana* var. *Jeffrayi*, is at Kew, and Henry has found others in cultivation in the British Isles.

The illustrations, coloured and uncoloured, are excellent, and these, together with the descriptions, should make identification a simple matter, and as an additional help there are analytical tables of the species in each genus which show their distinguishing characteristics at a glance.

"A Handbook of Hardy Fruits." By E. A. Bunyard. 258 pp. (John Murray, London, 1925.) 10s. 6d. net.

This book, which deals with the nomenclature of stone and bush fruits, Strawberries, Grapes, Figs, Nuts, Medlars and Crabs, etc., though of modest proportions contains a vast amount of valuable information and represents an enormous amount of painstaking care and study upon the part of the author. With the companion volume on Apples and Pears that appeared five years ago, the work undoubtedly fulfils the purpose intended by the author—to fill the place formerly occupied by Dr. Hogg's "Fruit Manual," now out of date and print. In an introductory note to this second and final volume, the author points out that with few exceptions—not more than a dozen—he has grown and studied all the varieties described in the book at Allington and that the varieties included are therefore all distinct and under their original names. Some 668 varieties are fully described in the 258 pages of this book, which number gives some idea

of the magnitude of the author's undertaking. The descriptions of the varieties are commendably clear and brief, and include notes upon all the characters likely to be useful for identification. Where possible there is attached a reference to some work in which the variety has been figured, the origin and history of the variety is given and frequently the author records his experience of the general usefulness of varieties for special purposes—notes that greatly enhance the value of the book to the grower and student alike. The author has provided keys to aid in the identification of Cherries, Peaches, Nectarines, Plums and Damsons, and Gooseberries, the application of which is simple and, so far as we have tested, fully efficient.

The classification of the Plums and Damsons is full and complete. Colour and shape of the fruit are the two main divisions, with subdivisions of size, season and smooth or downy shoots; whether 'cling-stone' or 'free-stone,' characters largely relied upon to assist identification in Mr. Hogg's key to Plums, the author makes no mention in his classification. In the key to Cherry varieties, it is interesting to note that the Dukes, Amarells and Morellos are grouped together under the Sour Cherries, the author discarding the old method of tabulating the Dukes and Morellos separately. In the section on Cherries the author gives rather fuller details than in some other fruits, and points out that a large number of varieties is omitted, since only those are described—77 in number—that he has actually grown and fruited. In other sections the reader may fail to find a well-known variety mentioned, such as for instance 'Comet' among the Red Currants, the absence of which variety probably means that the author has not yet satisfied himself upon the true identity of this old, and often misnamed, favourite. Among the Raspberries, the variety 'Lloyd George' is included in the autumn-fruiting section, and whilst it will be agreed that this was first introduced as an autumn-fruiting variety, it is now fairly established as a first favourite among the summer-fruiting Raspberries and as such deserves mention in this section. Black Currants, Gooseberries, and all other fruits are carefully and fully dealt with, and in the section on Berries—Black and Red—interesting notes upon the origin of many of those varieties are provided. Whilst a great deal of work still remains to be done, this book, with its companion volume, goes far to settle the nomenclature and synonymy of the Fruits commonly grown in this country.

"Plant Ecology." By W. B. McDougall. 8vo. 326 pp. (Henry Kimpton, London, 1927.) 14s. net.

This volume treats of Ecology in its widest sense, and includes not only the branch of plant communities but many subjects usually included in this country under Physiology. Thus the first two-thirds of the book are devoted to chapters dealing with such subjects as the function and habit of roots, stems, and leaves, pollination, disjunctive and conjunctive symbiosis, the factors of light, heat, air, soil, and water, also growth, growth-habit. The whole of this ground is covered in 205 pages, and though the treatment is necessarily somewhat sketchy the subject-matter has been selected wisely and is clearly and well presented. Some 70 pages follow on plant-communities and plant-succession, and the work concludes with chapters on phenology and applied ecology. The book strikes one as having been carefully written and one that, though illustrated mainly by American material, will be decidedly useful for English students.

"Herbs of Healing: a Book of British Simples." By Edward Step, F.L.S., with 76 illustrations from photographs by the author. 8vo. xiii + 206 pp. (Hutchinson & Co., Ltd., London, 1926.) 10s. 6d. net.

The long experience of the author in popularizing biological knowledge leads us to expect well-chosen examples of the plants in question, and some here are very good, accompanied by explanatory letterpress. We regret that the Latin names of the plants do not conform to botanic usage. When the specific name is one formerly in use as a generic name it should be spelt with a capital letter, as *Aconitum Napellus*, *Ranunculus Flammula*, *Oxalis Acetosella*, *Lythrum Salicaria* and *Aegopodium Podagraria*, and not as in the present volume with a small letter.

"The Palms of British India and Ceylon." By Ethelbert Blatter, S.J., Ph.D., F.L.S. Large 8vo. xxviii + 600 pp., 106 plates, 2 maps and 49 figures. (Oxford University Press, 1926.) 45s.

This book may be said to have two functions: (1) to enable those in India to recognize the palms which are there, and (2) to aid the student of the *Palmae*,

wherever he be, to realize the habit of a number of them. It is our duty to endeavour to measure the degree in which these two functions are fulfilled.

A description is given in the book of all the species of the family which are found wild in India, of all or almost all which are there cultivated, and of about two-thirds of those which are cultivated in Ceylon. The number slightly exceeds 200; and there are plates from photographs showing the habit of nearly one-half of them: of the 210 not figured, 59 are rattans. Fifty-three genera are illustrated, and eleven, of which species are described, are not illustrated. Seven of these eleven are only in gardens. All the plates appeared in the *Journal of the Bombay Natural History Society* between 1910 and 1918; the text which went with them has been amplified not a little for republication.

The plates are good; but they were better in the *Journal*; for in the book the ink sometimes shows through the paper, and not seldom has discoloured the opposite page. The text should have been sectioned more boldly, and the headlines of the pages chosen better so as to serve as indications of the contents. The information appears to be absolutely reliable: but the spelling of vernacular names should have been systematized; and the geographic distribution in some cases suggests a rarity which does not belong to the species under discussion. Many a young man has gone out to India, carrying in him leanings towards Natural History, and has there lost his interest in consequence of finding no guide to help him in understanding the new strange Nature surrounding him; one such man may have collected insects in the homeland, another eggs, another plants, aided and encouraged by the use of abundantly illustrated books; but in India they have failed to find the help that they needed—the help that a few good books could have given. This need no body of men has more fully recognized than the members of the Bombay Natural History Society; and one of the Society's aims has been to prepare a way for publishing them. The *Journal* has been used for the issue of illustrations, which have been gathered together into monographs afterwards. Thus it has been that several books on birds have appeared, some on snakes, and Father Blatter's on the palms. Undoubtedly this last is well calculated to meet the need, and it ought to have a wide sale in that country. As much economic information as possible has been embodied into it, and adds a human interest.

To the botanist outside India the book brings a means of realizing the appearance of palms which cannot be grown to maturity in glasshouses on account of their size, and enables the systematist to interpret aright the imperfect scraps which we store in our herbaria; for good figures are a *sine qua non* to anyone who wishes to classify the palms.

The book in regard to some of the species, especially *Lodoicea seychellarum*, is rich in original information.

"Rhododendrons for Everyone." By Capt. F. Kingdon Ward, F.R.G.S. 8vo. 122 pp. ("Gardeners' Chronicle," London, 1926.) 3s. 6d.

This is an excellent little handbook primarily intended for those who are commencing the cultivation of rhododendrons; indeed Capt. Kingdon Ward starts at the very beginning, inasmuch as he has a chapter on the acquisition of rhododendrons in which much good advice is given as to nurserymen and prices. The book will interest not only the beginner but also those who are already growers of these plants; for the author brings to bear on the problems of cultivation in this country the experience that he has gained from his travels in the rhododendron lands of China, India, and Tibet. The description of the climatic conditions in which rhododendrons grow in their native country will encourage the experimenter here to try new methods of cultivation to suit the different conditions.

Of interest also, to the beginner and expert alike, are the descriptions of the rhododendrons as they appear in their native country, and the very clear explanation of the way the various groups of species are distributed at different elevations and in different districts.

When Capt. Kingdon Ward comes to his selection of species for various gardens there may be differences of opinion. Most of us would think that the smaller the garden the smaller should the rhododendron be, although this is not Capt. Kingdon Ward's view. Many of us, too, who have a high opinion of the beauty of some members of the Saluense series, in which *Rhododendrons calostratum* and *radicans* are noteworthy, would hardly agree with the author in thinking them weird rather than beautiful.

Such points as these are, however, matters of individual taste, and with the bulk of what he says, most helpfully, on these points most rhododendron lovers would agree.

As regards cultivation in this country, Capt. Kingdon Ward has, of course, not had quite the same experience as he has had of rhododendrons growing on their native heath, and not everyone would agree with him that in England they need to be watered in summer. As a matter of fact, probably not one rhododendron in a hundred planted in gardens generally has ever received any watering in summer after it has left its seedling stage, although doubtless in most seasons a plant would benefit thereby. Still lack of water or labour to apply it need deter no one from starting a rhododendron garden.

Nor, perhaps, can limestone of the English brand be so lightly regarded by the would-be cultivator of rhododendrons as Capt. Kingdon Ward seems to suggest. But he is right in laying stress on the fact that they are easy plants to cultivate if only one has the knack of it, and this knack the handbook will do much to impart.

The author is wise to insist on the advantage of classifying rhododendrons in groups or series; as the whist player has to learn the leads, so the rhododendron gardener must know the series, otherwise confusion will be his lot.

The book is illustrated with one or two excellent photographs, and is altogether a most helpful and readable production.

"Fragrant Flowers. Perfumery in Ancient and Modern Times; being Part One of Plants of Sweet Scent and their Employment in Perfumery." By Mrs. M. Grieve and Miss Ella Oswald. 8vo. iv + 62 pp. (Published by the author at Whin's Cottage, Chalfont St. Peter. N.D. [1926].) 2s.

This little pamphlet is a compilation from various authorities of interesting facts about the history, art, and science of perfumery, which brings the fragrance of the modern garden pleasantly into line with our ancestors' appreciation of scented plants and with the activities of the commercial perfumer.

The material might here and there have been handled a little more critically, and the reader will do well to accept with rather more reserve than the authors have shown the statements that "the odour of plants would appear to be a product given off by the action of oxygen on volatile oils," that "orange and brownish flowers as a rule are wanting in perfume," and that "all Aquilegias are strongly scented." Two separate processes have been confused in the description of the method for extracting essential oils by means of a volatile solvent.

The book ends with a "survey of the most important plants bearing fragrant flowers"; such a list cannot satisfy everyone, but since Dodder and Hawkweed are included room might have been found for *Chimonanthus fragrans* and *Viburnum Carlesii*.

"Gardening for Beginners: a Handbook to the Garden." By E. T. Cook. Ed. 8. 604 pp. 8vo. ("Country Life," London, 1925.) 16s.

This is a reliable, well-illustrated book of proved value, brought up to date by competent hands, and published at a reasonable price. Doubtless faults could be found in it, as for instance in the omission of that most excellent Saxifrage, *apiculata*, or the fine Aster *Amellus* 'King George,' and in the way some names are entered, or the failure to include the apple 'Ellison's Orange' (though 'Newtown Pippin' is included) among dessert apples, or 'The Rev. W. Wilks' among cooks, and so on; but no two garden lovers would wholly agree on the lists of plants to include, and there is little here which may not find a place in most gardens, while the cultural advice is thoroughly sound.

"The Home Preservation of Fruit and Vegetables." By Margaret J. M. Watson. 8vo. 142 pp. (University Press, Oxford, 1926.) 6s. net.

This handbook is addressed by the author to Students of Horticulture, Domestic Science Teachers, Lecturers to Women's Institutes, and all those interested in the Conservation of Home-grown Fruit and Vegetables.

It covers a wide field: bottling and canning of fruit, bottling of vegetables, drying of fruit, vegetables and herbs, preparation of fruit jellies, fruit butters and cheeses, marmalades, fruit juices, syrup, and vinegar, crystallized and glacé fruits, brining, and pickling. Some of these subjects are treated at length, whereas others are dealt with very perfunctorily. An example of the latter is found under the section of fruit juices devoted to home-made wines, where the only information given is an 18th-century recipe. On the other hand, in the theory of jam-making, we find an excursion into bio-chemistry; much of this chapter will not be very intelligible to the ordinary housewife, who, beside the excursion referred to above, has to work out a somewhat difficult vulgar fraction

and has to weigh the jam at intervals during the boiling out in order to obtain the amount of sugar required in May Duke cherry jam when finished.

In these days, when a constant supply of vegetables can be maintained from an ordinary garden all the winter, and while fresh fruit in immense variety reaches these shores throughout the year, it is doubtful whether the home preservation of fruit and vegetables on a considerable scale is worth while in this country. At the same time some people like to preserve soft fruit and also, during a glut, plums, and to these this book, which appears to be based on a series of lectures to students, should be of use.

It is pleasant to find in a book which largely consists of recipes and quantities, and puts fruits into a modern contraption called a "sanitary tin," the old expressions "hulling strawberries," "strigging currants," and "topping and tailing gooseberries," while a human note is struck by a solitary table recipe, "How to serve preserved asparagus."

"Garden Receipts." By H. Owen. Edit. by C. W. Quin. Ed. 6. 8vo. 163 pp. (Crosby, Lockwood, London, 1925.) Paper boards, 2s. 6d. net.

This is a list of receipts for various things required in horticultural work arranged alphabetically, and as such should be at the hand of every gardener. Unfortunately, compendious as it is, some of the more recent developments in the way of remedies for such things as white fly, red spider, and rats are not included, nor is there a receipt for Bordeaux mixture or Burgundy mixture. The book indeed is almost as remarkable for what it omits as for what it includes, but still it should prove very useful.

"The Ferns (Filicales): treated comparatively with a View to their Natural Classification. Vol. II. The Eusporangiateae and other relatively Primitive Ferns." By F. O. Bower, F.R.S. iii + 344 pp. 1a. 8vo. (University Press, Cambridge, 1926.) 3os. net.

The more primitive ferns are dealt with botanically. A detailed review of this book would be out of place in our JOURNAL, but mention must be made of the inclusion of the curious "water ferns" *Marsilea* and *Pilularia* among the true ferns instead of with *Salvinia*, of the excellent illustrations with which the book abounds, and of the very full bibliographies and index which enrich it.

"Essentials of Systematic Pomology." By Brooks D. Drain. 284 pp. 106 figs. (Chapman & Hall, London, 1925.) 13s. 6d. net.

The author of this volume does not claim it to be original in subject-matter, free use having been made of other pomological books, bulletins, and periodicals, the aim being to provide a complete modern textbook of Systematic Pomology for use in classroom and laboratory.

To American students this should prove an extremely helpful work, and it can to a large extent be utilized by English students as well.

First tracing the development of systematic pomology from prehistoric days to the present time, the author leads up to a fairly detailed classroom and orchard study of the characters of varieties of almost all kinds of fruit grown in the States—many of which are common to this country, of course. Chapters are devoted to the classification of pomaceous fruits, stone fruits, citrus and small fruits, and the merits of different keys and methods of classifying varieties are discussed fully. Tabulated notes setting out the good and bad points and the comparative commercial values of the different varieties are given at the end of each chapter.

A chapter on Fruit Judging and Fruit Shows adds to the completeness of the volume, whilst the final chapter, dealing with the Code of Fruit Nomenclature adopted by the American Pomological Society, would form a useful study for breeders and introducers in this country as well as in America.

Teaching methods adopted are not always those generally favoured in this country; exercises set at the end of each chapter, for instance, often require the student to place a plus sign before each printed statement that is true and a minus sign before each that is not true, or to fill in descriptive blanks. Such forms of exercise must tend to become mechanical.

The numerous illustrations are excellent and the index complete.

"How to enjoy Wild Flowers." By Marcus Woodward. 255 pp. 8vo. (Hodder & Stoughton, London, 1927.) 2s. 6d.

Doubtless the author is right in his belief that the enjoyment of wild flowers comes largely out of pleasure in the flower for its own sake. Yet there are other

things that go to the making of full enjoyment, and doubtless the reader of this book (who seeks to learn how full enjoyment may be come by, so he starts with that pleasure) will be greatly helped by the lore it contains. It is a popular book, composed of fragments gathered from many sources and times, to be dipped into and used to whet the appetite for more—for wild flowers are simple things that have appealed to simple minds for ages and around them is woven a complicated story with mystic allusions and curious facts subtly mingled, truth and fancy jostling one another at every turn.

"Vegetable Gardening." By A. J. Macself. 239 pp. 8vo. (Thornton Butterworth, London, 1927.) 6s. net.

All the commonly grown vegetables and herbs are dealt with, and in the main up-to-date varieties are recommended.

"Fertilizers. Their sources, manufacture and uses." By Herbert Cave. (Pitman, London, 1926.) 3s.

This volume belongs to Pitman's well-known series of books on common commodities and industries. In spite of the fact that the author has dealt with his subject in the compass of 113 pages, he has made not only a complete account of it but also a very interesting and readable one. The book is thoroughly up to date. It mentions the Rothamsted manurial trials of potato with sulphate *v.* muriate of potash, activated sludge, and open-hearth basic slag, and discusses the Fertilizer and Feeding Stuffs Acts and their proposed amendments. The book is very complete and absolutely reliable. On one single point only would the reviewer wish to differ from the author, namely with regard to his statement on page 61, that "water soluble potash salts are rapidly absorbed and fixed in the soil by chemical action." The action is physical, and in this connexion it might even be useful to refer, without details, to surface tension and other colloidal properties of clay as the cause of absorption of salts in soils. A number of useful tables of production, consumption, prices, etc., are added. Possibly a short bibliography of a few more advanced treatises on fertilizers would be appreciated. Though written primarily from an agricultural point of view, this volume can also be strongly recommended to horticultural students and growers.

The author's statement that the very wide range of products from which growers can choose their fertilizers brings with it the responsibility of more scientific treatment, and that a greater knowledge of agricultural chemistry will be required for the proper use of concentrated manures, is very sound.

"Soil Conditions and Plant Growth." By Sir E. J. Russell. Ed. 5. 8vo. viii + 516 pp. (Longmans, Green, London, 1927.) 18s. net.

The continual growth of knowledge, the vast output of papers concerning soil science in its various aspects, the application of new knowledge to the investigation of soil and plant problems all render necessary frequent reviews of the whole subject, and no more able man than the author of this useful review of the present state of knowledge of soil conditions and plant growth could be found. The book is one that we commend to all who wish to gain a just insight into the work of scientific researchers in soil problems the world over.

"All about Gardening: Garden Making and Maintenance." 8vo. 384 pp. (Ward, Lock, London [1927].) 6s. net.

We are frequently asked for a book giving instruction in gardening, and here we have one—very full, very clear, and generally accurate. It is not one for the would-be grower of rare plants, but one dealing with common things of garden and greenhouse, with notes which can be easily understood and directions which can be readily followed, and possessing what so many books of similar aim lack—a good index.

"Plant Autographs and their Revelations." By Sir J. C. Bose. 8vo. xiv + 231 pp. (Longmans, Green, London, 1927.) 7s. 6d. net.

Many will like to have an account of his researches by the gifted author of the remarkable experiments in recording the living activities of plants which have been carried out over a considerable period of years. Whether we accept as final all the conclusions which their author believes justified, or whether time may modify the views he expresses, will not alter the interest that these experiments and records give, and for this reason we commend the book to our readers.

"The Low Road (Hardy Heathers and the Heather Garden)." By D. Fyfe Maxwell, with Coloured Plates by Winifred Walker. 8vo. 105 pp. (Sweet & Maxwell, London, 1927.) 6s. 6d. net.

This is a very interesting and readable volume dealing very fully with heaths and their cultivation. The author lives in Dorsetshire with an ideal climate and soil for hardy heaths, a county in which *Erica lusitanica*—the author uses the synonym *E. codonodes*—has become naturalized over a considerable area at Lytchett, near Poole.

Combining an intimate knowledge of the plants, their propagation and cultivation, with a fluent pen, the author treats of his subject in such a way that the book will be read and discussed as much in the drawing-room as among those directly concerned with the cultivation of heaths.

The title of the book "The Low Road" is not one with which everyone will agree as being the most suitable. At least the subject-matter contained in the book would be obvious if the secondary title "Hardy Heathers and the Heather Garden" had been chosen.

In the "Introduction" the author states his reasons for the choice of the title, depicting "the low road" as of natural simplicity, and "the high road" of artificial magnificence, represented by gaudy Dahlias, the latest scentless Rose, or the flaming "fire-irons" of the Scarlet Salvias.

The book is divided into eighteen chapters, in which the author discusses the planning and the planting of a Heather Garden, and the propagation, cultivation, and descriptions of species, hybrids, and varieties. The chapter containing notes on heathers for calcareous soils is of particular value, as the cultivation of heaths is seldom considered worth while in gardens on chalk soils. The four species with their varieties and hybrids specially recommended are *E. australis*, *E. carnea*, *E. mediterranea*, *E. stricta*, and the hybrid *E. darleyensis*.

In the list of the twenty best hardy heathers there are two notable omissions, *E. Veitchii*, which, in some gardens at least, flowers even more profusely than its two parents, *E. arborea* and *E. lusitanica* (*codonodes*), and *E. darleyensis*. In another part of the book, however, the author recommends the latter, describing the plant as "a most satisfactory and free-flowering Winter Heath," which it undoubtedly is.

The large number of varieties and hybrids described in the book, and well tabulated in the index at the end, may surprise many heather lovers. The index enumerates thirteen species, with one hundred and ten varieties or hybrids. There are seven coloured plates, including one of the beautiful and richly coloured *E. vagans* var. 'Mrs. D. F. Maxwell.'

Undoubtedly this well-produced book will fulfil a very useful purpose in giving valuable information to those who contemplate the making of a Heather Garden. It also exhaustively enumerates the many species, varieties and hybrids which should prove of value to cultivators of heaths desiring to make their collections as complete as possible.

NOTES AND ABSTRACTS.

[For Index of Periodicals quoted see previous volumes.]

Apple Blotch. By J. W. Roberts and L. Pierce (*U.S. Dep. Agr. Farm. Bull.* 1479, pp. 1-12).—The bulletin details the symptoms of the apple blotch disease and gives a list of susceptible and resistant varieties. Amongst the latter are 'Jonathan,' 'Winesap,' 'York,' 'Imperial,' 'Grimes' Golden,' 'Delicious,' and 'Stayman Winesap.' Directions for spraying and the making of Bordeaux and lime-sulphur solutions are given.—A. B.

Apple Calville Blanc in Storage. By G. Rivière and G. Pichard (*Jour. Soc. Nat. Hort. Fr.*, ser. 4, vol. xxvii, pp. 149-151).—During six months in the fruit room the apple 'Calville Blanc' lost 3.33 per cent. in weight, due to evaporation of water (90.6 per cent.) and escape of carbon dioxide (9.4 per cent.).—S. E. W.

Apple Canker (*Phyllosticta solitaria* E. & E.). By E. F. Guba (*U.S. Agr. Exp. Sta. Illinois, Bull.* 256, Feb. 1925, pp. 481-558; 4 plates).—The paper gives a full account of the life-history of this organism and describes the effects of various spraying mixtures upon the fruiting bodies of the fungus. Six sprayings should be given through the season of growth, while attention should be paid to careful and systematic prunings of the trees. Soil treatment should also be employed if required. A full bibliography is appended.—A. B.

Apple Perennial Canker (*Gloeosporium perannans* Zellar and Childs). B. S. M. Zellar and L. Childs (*U.S. Agr. Exp. Sta. Oregon, Aug. 1925, Bull.* 217, pp. 1-18; 6 figs.).—This disease differs from apple anthracnose in that it is perennial, is distinctly a wound parasite, in the shape of the conidia, and its reactions on media in culture. No preventive measures are as yet known.—A. B.

Apple Scab. By J. W. Roberts and L. Pierce (*U.S. Dep. Agr. Farm. Bull.* 1478, pp. 1-12).—This describes the very destructive and widely distributed disease caused by *Venturia inaequalis* (Cke) Winter. It causes much injury to the leaves, resulting in premature defoliation of the trees. The most resistant varieties are 'Grimes' Golden,' 'Ingram,' 'York,' 'Imperial.' Control measures include spraying with Bordeaux and lime-sulphur.—A. B.

Apple Scab, Control of. By N. B. Bagenal, W. Goodwin, E. S. Salmon, and W. M. Ware (*Jour. Min. Agr.* 33, Apr. 1926).—The Apple 'Bismarck' becomes infected on foliage produced before flowering time; spraying is therefore necessary before the buds burst, and Bordeaux mixture or lime sulphur is recommended.—F. J. C.

Apple Scab or Black Spot, Biological Observations on. By E. S. Salmon and W. M. Ware (*Jour. Pom. and Hort. Sci.* vol. 4, June 1925).—A great deal of difference was found in the extent of attack of apple scab upon foliage of different varieties of apple in a particular orchard. 'Annie Elizabeth' was found to be free; on 'Lane's Prince Albert,' 'Bramley's Seedling,' and 'Beauty of Bath' about 50 per cent. of the leaves were attacked; on 'Newton Wonder,' 67 per cent.; and on 'Cox's Orange Pippin,' 'Worcester Pearmain,' and 'Bismarck,' about 100 per cent.—F. J. C.

Apple, Some Effects of Freezing on Mature Fruits of the. By D. B. Carrick (*U.S.A. Exp. Sta., Cornell Univ., Memoir* 81, Dec. 1924; 5 figs., 7 tables, 7 plates).—Describes experiments extending over six years with thirteen varieties of apples in cold storage conditions, in order to determine the initial freezing point of the cell sap in contact with the protoplasm, as well as the effect of subsequent degrees of freezing upon the tissue. A potentiometric apparatus was used, including specially constructed thermo-elements for precise measurements

of the freezing-point depression of cell sap in plant tissue. The lethal point in apple tissue may be from 1° to 3° C. below the freezing point. Slightly frozen apples become more susceptible to fungus diseases and therefore do not keep so well, and slowly frozen apples show more discoloration if thawed at 0° C. than at 10° C. Severely injured apples may be used for culinary purposes, but must be kept at -20° C. till wanted.—A. P.

Apple Trees, Crown Injury of. By H. E. Thomas (*U.S. Exp. Sta. New York*, March 1926, *Bull.* 448, pp. 1-10; 1 fig.).—Crown and root injury of apple trees are general in New York State. No constant micro-organism is found, but *Hypholoma sublateritium* causes decay in bark and wood of old trees. The major part of the injuries are largely due to low temperatures. Grafting with apple seedlings and scion-rooted 'McIntosh' and 'Delicious' stock has proved to be useful in promoting recovery of injured trees.—A. B.

Apples and Pears, Storage of. By H. Hartman (*U.S.A. Exp. Sta. Oregon*, *Bull.* 206, pp. 3-32).—Loss of weight with attendant shrinkage in volume in pears is minimized by storage in a relative humidity of 80-85 per cent. Polishing apples, causing loss of bloom, shortens the life of the fruit and increases the rate at which it loses weight in storage.—S. E. W.

Apples, Gases in. By G. Rivière and G. Pichard (*Jour. Soc. Nat. Hort. Fr.*, ser. 4, vol. xxvii, pp. 93, 94; 1 fig.).—The gas contained in 100 grammes of ripe apple pulp consists of carbon dioxide 35 c.c., oxygen 13 c.c., and nitrogen 63 c.c.—S. E. W.

Apricots, Brown Rot (*Monilia* blight). By B. A. Rudolph (*U.S. Agr. Exp. Sta. California*, *Bull.* 383, Feb. 1925, pp. 1-56; 10 figs.).—This blossom blight is due to a species of *Sclerotinia*, and in recent years has caused much loss in California. The plants may be attacked at any time in the year, but the blossoms and, later, the fruit are more especially attacked.

The cause of the increased loss is probably due to the growings of many varieties susceptible to the disease. Control measures include the use of various liquid fungicides as well as oil emulsions, dusts, and so on. A spray applied in the spring when the buds are expanding and, later, in the red bud stage affords the best control. A short bibliography is appended.—A. B.

Asparagus. By A. J. Pinn (*Agr. Gaz., N.S.W.*, vol. xxxvii, pp. 145-149; 1 fig.).—Asparagus requires a liberal supply of manure. After the crop is cut give a top dressing of sodium nitrate 250 lbs., superphosphate 400 lbs., and potassium chloride 150 lbs. per acre. Common salt is no longer used. In autumn mulch with farmyard manure, or in its absence with spent tan bark.
S. E. W.

Asparagus Crowns. By H. A. Jones and W. R. Robbins (*Agr. Exp. Sta. California*, *Bull.* 381, pp. 1-34; 15 figs.).—When asparagus is cultivated on a large scale, it is well to raise the crowns from seed. A small acreage is set aside for seed production only. Weak male plants are eliminated before flowering, and only the seed from the best females is harvested. The seed is soaked in water at 86° F. for four days to hasten germination. It is then spread on canvas to remove excessive moisture and at once sown in moist sandy loam or light peat soil at a depth of 1½-2 inches. Early planting is desirable, and a good supply of water is necessary. 'Mary Washington' is the best variety. In autumn or early winter the tops are cut off and the crowns lifted. Every effort is made to avoid injury to the fleshy roots. The crowns are stored on dry boards or a cement floor and replanted without undue delay. Small crowns and crowns with a large number of small buds are discarded.—S. E. W.

Beet and Mangold, Downy Mildew of. By E. S. Salmon and W. M. Ware (*Jour. Min. Agr.* 32, Dec. 1925).—An account of the occurrence of the downy mildew, *Peronospora Schachtii*, on sugar beets near Ely. It is recommended that seed beds should be made as far as possible from infected areas and that diseased refuse should be completely destroyed.—F. J. C.

Bud Selection. By E. S. West (*Agr. Gaz., N.S.W.*, vol. xxxvii, pp. 469-473; 1 fig.).—Orchard trees yielding poor crops should be cut back and reworked with buds from better trees. It is best to take budding wood from behind clusters of fruit which are true to type, although this involves sacrificing the fruit for the season.—S. E. W.

Cabbage, Wire Stem of. By L. O. Gratz (*U.S. Agr. Exp. Sta.*, Jan. 1925, *Memoir* 85, pp. 1-60; 7 plates).—Wire stem of cabbage is caused by a strain of *Corticium vagum* B. and C., which is physiologically distinct from the strain causing lesions on potato stems. These are non-pathogenic to cabbage, and the reverse also holds good. The maximum and minimum temperatures for the growth of the fungus in pure culture are approximately 9° and 31° C. The optimum appears to be between 22° and 26° C. The fungus shows a wide range (pH) for growth. Practically any combination of soil temperatures and moisture favourable to the host is equally favourable to the growth of the fungus and the development of wire stem. No changes, therefore, in environmental conditions will control the disease. A list of references is appended.—A. B.

Celery Blight, The Importance of Controlling, in the Seed Bed. By A. G. Newhall (*Jour. Phytopathology*, xvi, pp. 467-472; July 1926).—It has been found that the chief source of infective material in celery cultivation both as regards the attack of *Septoria apii* and bacterial blight is the seed bed; and that both attacks can be dealt with by copper sulphate (20 parts) and lime (80 parts) used as a dust at that time.—F. J. C.

Cherry Leaf Spot, Residual effects and control. By W. C. Dutton and H. M. Wells (*U.S. Agr. Exp. Sta.*, Mich., May 1925, *Bull.* 147, pp. 1-14; 1 fig.).—Leaf spot in cherries is caused by *Coccomyces hiemalis*, and heavy premature defoliation occurs resulting in considerable reductions in yield and growth. Control measures suggested include a spray of lime-sulphur (3 gallons in 100 water), which should be applied (a) just after the petals have dropped; (b) two weeks after; (c) four weeks after; and (d) just after harvest.—A. B.

Cherry, Pollination of the Sweet. By Warren P. Tutts and Guy L. Philp (*U.S.A. Exp. Sta.*, College of Agr., Berkeley, California, *Bull.* 385, March 1925; 11 figs.).—The report indicates that a number of so-called varieties are rather types consisting of a number of strains, some of which are good pollinizers and others not. It is considered that the safest way to obtain a high producing orchard is to plant 'Mazzard' or 'Mahaleb' seedlings, as these are considered to be more or less immune to bacterial gummosis, and later top-work the branches with scions of desirable strains. (See also *Bull.* 212, May 1925, of Oregon Agr. Coll. Exp. Stn.)—A. P.

Cherry "Saint Médard." By G. Rivière and G. Pichard (*Jour. Soc. Nat. Hort. Fr.*, ser. 4, vol. xxvii, pp. 179-181).—The cherry 'Saint Médard' makes vigorous growth and is very prolific, bearing large round fruit with small stones. The cherries are bright red, juicy, and very sweet.—S. E. W.

Citrus Trees. By W. Le G. Brereton and W. B. Stokes (*Agr. Gaz.*, N.S.W., vol. xxxvii, pp. 463-468).—Experiments on manuring citrus trees confirm previous results, that the use of potash is decidedly remunerative.—S. E. W.

Currants and Gooseberries and White Pine Blister Rust. By G. M. Darrow and S. B. Detwiler (*U.S. Dep. Agr. Farm. Bull.* 1398, Aug. 1924, pp. 1-38; 26 figs.).—Since these fruit bushes act as an intermediate host in the life-history of a destructive fungus attacking white pine, this bulletin advocates the destruction of all these bushes in the neighbourhood of pine plantations. It appears that the black currant (*Ribes nigrum* L.) is more susceptible than other species to the white pine blister rust, and it is recommended that the cultivation of this plant be abandoned in the States.—A. B.

Currants, Red and White. By P. Thayer (*U.S.A. Exp. Sta. Ohio, Bull.* 713, pp. 309-394; 14 plates, 9 figs.).—More than 100 varieties of red and white currants are in cultivation. They are descended from *Ribes vulgare*, *R. vulgare* var. *macrocarpum* and *R. petraeum*. It is suggested that foliage characteristics, colour, shape of blossom, and time of appearance and falling of leaves should form the basis of a system of classification. Of the *Macrocarpum* hybrids, 'Fertile de Palnau' is one of the best; it blooms early, resists frost better than 'Fay,' and bears heavy crops of large, sour fruit. 'Perfection' does well on a medium clay loam soil, and is unsurpassed for productiveness, beauty, and quality. Unfortunately, it does not produce many canes. 'Diploma' and 'Red Cross' are the best for home use of the *R. vulgare* hybrids. 'Pomona' is a heavy cropper, 'Wilson Long Bunch' is an attractive late sort, with few seeds, 'Wilder'

is the best for market, and 'White Grape' is the best white variety. 'Victoria' alias 'Raby Castle,' derived from *R. rubrum*, does well on gravelly soil. 'Prince Albert' or 'Rivers Late Red' is a late variety and a good cropper, excellent for jelly. The foliage resists disease and is not attacked by insects.—S. E. W.

Dewberries Anthracnose, Sprayings for. By W. C. Dutton (*U.S. Agr. Exp. Sta. Bull.* 144, March 1925, pp. 1-16; 2 figs.).—Anthracnose is caused by the fungus *Plectodiscella veneta*. It lives over the winter on the old canes, where it forms a series of grey spots. In the spring these become active and infect the new canes and blossoms. The spraying mixture found to be effective in Michigan consisted of liquid lime-sulphur (5 gallons in 100 water) plus 1 pound of calcium caseinate. To control scale insects, the strength of the lime-sulphur should be increased to 12½ gallons per 100 of water.—A. B.

Electroculture. By L. J. Briggs, A. B. Campbell, R. H. Heald and L. H. Flint (*U.S.A. Dep. Agr., Bull.* 1379, pp. 1-34; 1 fig.).—A series of experiments, extending over a period of eight years, on the influence of a wire network highly charged with electricity on the growth of plants growing under it did not show any well-defined benefit to the crop.

Experiments with soil currents by different investigators yielded contradictory results.—S. E. W.

Fig Smut. By E. H. Phillips, E. H. Smith, and R. E. Smith (*U.S. Agr. Exp. Sta. California, Bull.* 387, April 1925, pp. 1-40).—The fig is one of the States' best commercial fruits, and some 10,000 tons of dried figs are shipped from California per annum. It is, however, attacked by the fig smut disease (*Aspergillus niger*) while on the tree, and this is spread from tree to tree by a small fruit beetle (*Carpophilus hemipterus* [Linn.]) and also by a fly, *Drosophila ampelophaga* (Loew). Spraying has no appreciable effect. The destruction of the insects is the only way for complete eradication.

The Black Mission and Kadota varieties are much less affected than the Calimyrna and the Adriatic, but this may be due to the solid structure and closed "eyes" of the first varieties, rather than to any real resistance. It may be possible to obtain a desirable immune white fig by breeding.—A. B.

Filberts. By C. E. Schuster (*U.S.A. Exp. Sta. Oregon, Bull.* 208, pp. 1-36; 13 figs.).—Filberts require deep, fertile, well-drained soil. 'Barcelona' is the best variety. Plant in winter or spring, but not too deep. To ensure pollination, interplant (1 in 9) 'White Avellane,' 'Du Chilly' and 'Daviana,' or preferably 'Nottingham,' if it can be obtained. Propagate by layering. Young trees are subject to bacterial blight. Cut out the infected parts and disinfect the wounds with an aqueous solution containing mercuric cyanide 0.02 per cent. and mercuric chloride 0.02 per cent. The bud mite (*Eriophyes avellanae*) is checked by spraying with lime-sulphur mixture.—S. E. W.

Fruit-Bud Differentiation in Deciduous Fruits. By Warren P. Tufts and E. B. Morrow (*U.S.A. Exp. Sta., College of Agr., Berkeley, California, Hilgardia*, vol. i. No. 1, May 1925; 2 tables, 11 plates).—A report of studies under different conditions over a period of nine years. The broadening and thickening of the floral axis was taken as evidence of the first differentiation of the floral parts, and the writers conclude that the date of this may vary in widely separated regions within any one species.—A. P.

Fruitfulness. By G. Bellair (*Jour. Soc. Nat. Hort. Fr.*, ser. 4, vol. xxvii. pp. 247-251).—The fruitfulness of trees is a question of nutrition. Trees well supplied with potash, magnesia, and phosphates will bear good crops.—S. E. W.

Fruit Pink Rot. By M. Simmonet (*Jour. Soc. Nat. Hort. Fr.*, ser. 4, vol. xxvii. pp. 93, 94; 1 fig.).—Apples, plums, pears and quinces suffer from Pink rot, caused by the fungus *Cephalothecium roseum* attacking fruit previously damaged by insects. Spraying with copper solutions is the best preventive. No damaged fruit must be placed in storage and the temperature of the fruit room (which must be well ventilated) should be kept between 35° and 39° F.—S. E. W.

Fruit Setting. By R. J. Noble (*Agr. Gas., N.S.W.*, vol. xxxvii. p. 444).—The non-setting of fruit may be due to several causes, e.g. (1) self-sterility or partial self-sterility; (2) absence of suitable varieties for cross-pollination;

(3) lack of available nitrogen in the soil; (4) unfavourable weather, drought or frost; (5) absence of insects necessary for pollination.—S. E. W.

Gardenia Fortunei. By F. Garzolini (*Jour. Soc. Nat. Hort. Fr.* ser. 4, vol. xxvii. pp. 413, 414).—*Gardenia Fortunei* succeeds well when grafted on *G. paraguayensis*. The latter is a native of the mountainous districts of Brazil and Paraguay. Under suitable conditions it grows vigorously, attaining a height of 13 feet.—S. E. W.

Geranium Leaf Spot and Botrytis. By L. E. Melchers (*Jour. Agr. Res.*, vol. xxxii, No. 9, May 1926, pp. 883-894; 3 plates).—A species of *Botrytis* similar to the *cinerea* type may cause blossom blight and leaf spot in the geranium (*Pelargonium hortorum*). Infected petals and spores cause the leaves to be attacked and destroyed. This reduces the value of the geraniums for ornamental purposes. The organism macroscopically and microscopically resembles *Botrytis cinerea* Pers., which is commonly found as grey mould on lettuce.—A. B.

Grape Hyacinths. By D. Griffiths (*U.S.A. Dep. Agr., Bull.* 1327, pp. 1-15; 2 plates, 3 figs.).—The best varieties of grape hyacinth are 'Heavenly Blue' and 'Azurea.' They can be raised from bulbets and from seed. Bulbs in storage must be spread out in thin layers, with free access of air to facilitate drying. The dried bulbs are protected from exposure to direct sunlight. Imperfectly dried bulbs are frequently attacked by *Botrytis*, for which there is no effective remedy. *Ustilago Vaillantii* (smut) also attacks the flowers. As soon as it is observed the diseased bulb must be eliminated and burned.—S. E. W.

Hazels, Pollination experiments with (Blombiologiska försök med hassel vid Alnarp 1924-1926). By E. Johansson (*Meddel. från Perm. Komm. för Frukodlingsförsök*, 11; 1927).—Hazel varieties except 'Cosford' appear to be self-sterile but probably interfertile, though not with *Corylus Colurna*. The experiments are being continued.—F. J. C.

Irises, a Report on Sterility in. By L. A. Cover, M. R. Swabey and A. B. Stout (*Bull. Amer. Iris Soc.* 16, July 1925).—This is a report upon a single season's work in testing the fertility of tall bearded Irises. Four classes are distinguished, viz. (1) varieties highly fertile both as seed and pollen parents, (2) varieties having only fertile pollen, (3) varieties with sterile pollen but fertile ovules, (4) varieties with sterile pollen and ovules.—F. J. C.

Irises, Garden. By B. Y. Morrison (*U.S.A. Dep. Agr., Farm. Bull.* 1406, pp. 1-46; 53 figs.).—An account of the various Irises in cultivation is followed by directions for propagating and hybridizing. The prevalent diseases are rust (*Puccinia iridis*) and leaf spot (*Heterosporium gracile*). Spray with liver of sulphur for the former and with ammoniacal copper carbonate for the latter disease. Root rot is caused by *Pseudomonas iridis*. The remedy is to lift the rhizomes, cut away the soft part, expose to sunlight for one or two days, and disinfect with a dilute solution of potassium permanganate. The moth of the Iris borer (*Macronoctua onusta*) deposits eggs on the basal leaves in autumn. The larvæ hatch out in spring and eat their way down inside the leaves. The grubs are squeezed out of the wounded leaves by hand.—S. E. W.

Kale, Black Rot in. By F. P. McWhorter (*U.S. Agr. Exp. Sta., Virginia Truck Bull.*, 49, Oct. 1924, pp. 358-364; 3 figs.).—Kale (*Brassica oleracea* var. *acephala*) is a very hardy plant, but it is often attacked by a bacterial rot known as Black Rot. The causal organism is *Bacterium campestre* (Pammel) E.F.S., and this disease may be recognized by a yellowing of the lower leaves. The plant ultimately decays into a black rotten mass. The organism attacks many other of the Brassicas and Cruciferae. It is highly infectious and may survive in the ground for some time after cropping.

Seed treatment and rotation of crops are suggested as control measures.

A. B.

Lemons and Borax. By R. J. Benton (*Agr. Gaz., N.S.W.*, vol. xxxvii. p. 94).—Lemons immersed for five minutes in a 5 per cent. solution of borax at 115° F. do not turn mouldy.—S. E. W.

Lettuce 'Ring-spot' or 'Rust.' By E. S. Salmon and H. Wormald (*Jour. Min. Agr.* 30, May 1923).—Lettuce grown in the open has been badly attacked by *Marssonia Panattoniana* (see this JOURNAL, 87, p. 541).—F. J. C.

Lilium tigrinum. The Capsules, Seed, and Seedlings of the Tiger Lily. By A. B. Stout (*Bull. Torr. Bot. Club*, 53, pp. 269-278; June 1926).—Hitherto capsules of *Lilium tigrinum* had not been illustrated and are not known wild; but the author has found it highly fruitful with certain other lilies, such as *L. Maximowiczii* and *L. sutchuenense*, though self-sterile. Miss Preston's work at Ottawa is referred to, as is that of Kerslake in Australia. The type of sterility appears to be self-incompatibility, which the author finds common in many lilies, even in those which usually seed abundantly.—F. J. C.

Lily, Madonna. By D. Griffiths (*U.S.A. Dep. Agr., Bull.* 1331, pp. 1-17; 2 figs.).—The Madonna Lily can be propagated by scales, by layering stems and by seed. To obtain seed it is necessary to pollinize the flowers by hand. The pollen of *L. longiflorum* may be substituted for that of the Madonna Lily when the latter is not available. This lily dislikes heavy, undrained loam. Attacks of *Uromyces lilii* and *Botrytis* are kept in check by repeated spraying with Bordeaux mixture. S. E. W.

Maple Wilt. By G. F. Gravatt (*U.S. Dep. Agr., Cir.* 382, May 1926, pp. 1-14; 9 figs.).—Maple wilt is indicated by sudden wilting, thin foliage, and slime on trunks, while the sapwood has characteristic green streaks. It is transmitted by insects and pruning tools, and may attack all species of Maple. The fungus is a species of *Verticillium*. Cutting out and burning the infected branches is suggested as a control measure.—A. B.

Melons, Rock. By J. Douglas (*Agr. Gaz., N.S.W.*, vol. xxxvii, pp. 453-456; 2 figs.).—In New South Wales Rock melons are one of the quickest and most profitable crops to cultivate. The best varieties for market are 'Early Hackinsack,' 'Rocky Ford,' or 'Netted Green,' 'Paul Rose,' and 'Early Nutmeg.'—S. E. W.

Mosaic Diseases of Plants. By K. H. Fernon (*U.S. Agr. Exp. Sta., Cornell, Memoir* 96, Dec. 1925, pp. 1-34; 7 plates).—Inoculation experiments were conducted with mosaics on nineteen plants, fifteen of which were Solanaceae. It would appear that eight varieties of mosaics exist. They are named, for convenience, A. to H.

Mosaic A attacks *Lycopersicon esculentum*, *Martynia louisiana*, *Nicotiana rustica*, *N. Tabacum*, *Physalis heterophylla*, *P. subglabrata*, *Solanum aculeatissimum*, *S. atropurpureum*, *S. carolinense*, *S. nigrum*, *S. tuberosum*.

Mosaic B attacks *Datura meteloides*, *D. Stramonium*, *Lycopersicon esculentum*, *Nicandra physalodes*, *N. glutinosa*, *Solanum aculeatissimum*, *S. atropurpureum*, *S. carolinense*, *S. tuberosum*.

Mosaic C attacks *Datura meteloides*, *D. Stramonium*.

Mosaic D attacks *Nicotiana glutinosa*.

Mosaic E attacks *Phytolacca decandra*.

Mosaic F attacks *Rumex obtusifolius*.

Mosaic G attacks *Phaseolus vulgaris*.

Mosaic H attacks *Echinocystis lobata*, *Nicandra physalodes*, *Nicotiana glutinosa*.

The data appear to indicate that potatoes which are apparently healthy carry a virus which is able to produce mosaic symptoms when transferred to other species.—A. B.

Narcissus Bulbs. By D. Griffiths (*U.S.A. Dep. Agr., Bull.* 1270, pp. 1-31; 9 plates, 3 figs.).—A Narcissus farm may be started with bulbs which have been forced or used for bedding. Plant in well-drained friable sandy loam late in August or early September. Replant biennially except the Polyanthus group, which should be moved annually. Avoid the use of crude manure when planting. Stocks may be accumulated by planting and allowing the fields to be overrun with grass for three or four years. The bulbs increase in number but decrease in size, but when replanted increase in size vigorously. Rotation of crops is essential. Bulbs attacked by the Narcissus fly (*Merodon equestris*) or by nematodes are immersed in water at 110° F. for two or three hours. Exposure to the sun injures the bulbs.—S. E. W.

Opuntia. By G. Rivière and G. Pichard (*Jour. Soc. Nat. Hort. Fr.*, ser. 4, vol. xxvii. pp. 417, 418).—The pulp of *Opuntia robusta* and *O. cylindrica* contains 0.5–1.5 per cent. more sugar than *O. Ficus indica* (the Barberry Fig).—S. E. W.

Orchard Trees with Armillaria mellea. By A. H. Hendrickson (*U.S. Agr. Exp. Sta.*, California, Cir. 289, May 1925, pp. 1–14; 7 figs.).—*Armillaria mellea* is a root disease commonly found upon the oak, but in California it frequently infests the roots of orchard trees. The attacked trees have the characteristic white fan-shaped mycelium of the fungus between the bark and the wood. It has been suggested that the fungus occurs in orchards from the roots of the oak trees, which formerly covered the ground. All root stocks are more or less susceptible to the attack, but the apple 'Delicious' and the French pear are resistant to the disease. The fig and the black walnut are also immune.

No effective method of control is known, other than isolating the attacked trees by trenching around them.—A. B.

Pear, A Study of the Conductive Tissues in Shoots of the Bartlett, and the Relationship of Food Movement to Dominance of the Apical Buds. By Frank E. Gardner (*U.S.A. Exp. Sta.*, College of Agr., Berkeley, California, Tech. Paper 20, April 1925; 3 tables, 8 plates).—The writer holds that the new aspect of growth arising from the carbohydrate-nitrogen concept may, when more clearly understood, form a basis for the treatment of trees with a view to the proper balance of growth and fruitfulness. This study is thought to indicate that the phloem is the tissue largely concerned in the longitudinal movement of foods and that there is a direct relationship of food movement to dominance of the apical buds.—A. P.

Pear Pollination. By Warren P. Tufts and Guy L. Philp (*U.S.A. Exp. Sta.*, College of Agr., Berkeley, California, Bull. 373, Dec. 1923; 11 figs., 10 tables).—A study with varieties in differing conditions in several seasons, some, e.g. 'Doyenné du Comice,' being classed as self-fertile in valleys but self-sterile in coastal and foot-hill conditions, and *vice versa*. Similar differences were observed in the effectiveness of certain varieties as pollinizers.—A. P.

Pears, Bartlett, Respiration of. By J. R. Magness and W. S. Ballard (*Jour. Agr. Res.*, vol. xxxii. No. 9, May 1926, pp. 801–832; 5 figs.).—In order to determine the physiological processes in the ripening of the fruit and the influence of various temperatures of storage upon these processes, experiments were made to determine the volumes of CO₂ given off by the fruit from the time of picking until fully mature under different storage conditions. The rate of ripening seems to parallel the CO₂ output. In fruit at 59° F. there was a marked acceleration in the CO₂ output per kilogram of fruit per hour from the time of picking until it was soft yellow-ripe. Early picked fruit respire at a lower initial rate, and this rate does not increase so rapidly as later picked fruit from the same tree. Such fruit requires a longer time to ripen. At 37° F. there was a slight increase in rate of CO₂ output. At 30° F. there was no increase in CO₂ output even after four months' storage.

Bartlett pears ripen slowly at the lowest temperature. They appear to ripen about twice as rapidly at 37° F. as at 30° F. There is an increase in catalase activity in these pears after picking, followed by a decrease as the fruit approaches ripening condition. The concentration of CO₂ is higher and the concentration of oxygen is lower within the tissues of these pears held at higher temperatures than in those held at the low temperatures of cold storage.

As the fruit ripens at 60° F. there is a sharp increase in CO₂ content, and a decrease in O₂ content, the temperature remaining constant. So that the increased respiration rate is not due to better aeration in the ripier fruit. The high concentration of CO₂ and the corresponding low O₂ concentration in fruit ripening at 60° F. appear to be associated with the development of high aroma and flavour in the fruit.

A short bibliography is appended.—A. B.

Pears, The Cold Storage of. By E. L. Overholser and L. P. Latimer (*U.S.A. Exp. Sta.*, College of Agr., Berkeley, California, Bull. 377, April 1924; 10 figs., 10 tables).—Describes experiments conducted to determine the effects of certain factors upon the behaviour of 43 varieties of pears in cold storage. Among those exhibiting the most satisfactory keeping qualities were 'Winter Nelis' and 'Vicar of Winkfield'.—A. P.

Peas, Green. By M. H. Reynolds (*Agr. Gaz., N.S.W.*, vol. xxxvii. pp. 387, 388).—Field experiments show that superphosphate is the most profitable fertilizer for green peas. The pods fill two or three weeks earlier than the unmanured plot.—S. E. W.

Phytophthora, Physiology of the Genus. By L. H. Leonian (*U.S. Agr. Exp. Sta., West Virginia, Scient. Paper* 11, July 1925, pp. 443-498; 13 plates).—Fifty-three strains of *Phytophthora* have been studied in pure cultures of solid agars, liquid media, and M/100 sugar solutions, amino acids, nitrates, sulphates, phosphates, chlorides, and a carbonate.

The presence or absence of aerial hyphae, of sporangia, and oogonia, the rate and type of growth of colonies on solid agar at different temperatures, and the production or non-production of sporangia and oogonia in various solutions, have been used by the writer to obtain specific reactions useful in identification of these organisms.

The saltation phenomenon in *Phytophthoras* has been studied in detail, and it is concluded that no new species or varieties have been produced by saltation.

A key based upon physiological reactions has been drawn up by the writer.

A short bibliography is appended.—A. B.

Pollen, germination in mineral solutions (Frömjölets förmåga att utbilda pollen-slangor i sockerlösning utan och vid närvaro av mineralsalter). By E. Johansson (*Meddel. från Perm. Komm. för Fruktodlingsförsök*, 9; 1927).—It was found that a 20% sugar solution in distilled water proved a suitable medium for the germination of pollen of hazel and other fruit trees, but a solution of the same strength in tap water (which contained much lime) gave no germination. The result of experiments tends to show that the presence of mineral salts rather than the reaction of the medium is the inhibiting factor.—F. J. C.

Pomaceous Fruit Trees, European Canker of. By S. M. Zellar (*U.S. Agr. Exp. Sta., March 1926, Bull.* 222, pp. 1-52; 24 figs.).—The European canker of apple and pear trees is fully described, with particular reference to conditions found in Western Oregon. The life-history of the causal organism (*Nectria galligena* Bres.) is fully described as it occurs in nature and in culture. The pathological anatomy of the host and the sources of infection are described; the development of cankers is followed from the beginning to the perennial stages of mature cankers. The open, closed, and superficial types of canker found and the condition necessary for each type are described. Natural conditions of infection may occur in any part of the rainy season, but the majority of infections occur in the autumn of the year. Control measures are both preventive and eradictory. The elimination of diseased tissues and orchard sanitation are advocated. Bordeaux paint (linseed oil and powdered Bordeaux) is useful for treating the larger wounds of the trees.

A short list of references is given.—A. B.

Potato, Blackleg Disease of. By J. E. Kotila and G. H. Coons (*U.S. Agr. Exp. Sta., Michigan, Tech. Bull.* 67, May 1925, pp. 1-30; 7 plates).—The blackleg disease of potatoes is found to be caused by a bacterium, *B. atrosepticus* van Hall. This organism attacks many other plants besides the potato; *Nicotiana rustica* is a new host for this parasite. The bacteria secrete a pectin-dissolving enzyme as well as a toxic substance. The plants attacked show a blackening of the stem above ground, with wilting of leaves, and the decay soon passes down into the tubers. Small quantities of inoculum placed upon tuber slices cause an "oedema" formation. The bacteria may live over the winter in the tubers in the soil. No commercial varieties have been found to be entirely resistant to this disease.—A. B.

Potato Scab Control. By H. H. Wedgworth and C. B. Anders (*U.S. Agr. Exp. Sta., Mississippi, Cir.* 61, Dec. 1925, pp. 1-4).—This circular suggests soaking in a weak solution (1 oz. corrosive sublimate in 8 gallons of water) of corrosive sublimate. The results obtained were 97 per cent. clean tubers, compared with 24 per cent. clean tubers from an untreated lot of similar seed tubers, in the case of seed free from scab. Slightly scabbed seed showed 93 per cent. clean tubers after similar treatment, compared with 12 per cent. clean tubers untreated.

A. B.

Potato Scab Disease and Tuber Growth. By H. Fellows (*Jour. Agr. Res.*, vol. xxxii. No. 8, April 1926, pp. 757-782; 5 plates).—The writer's attention was drawn to the fact that the largest and best tubers were commonly most severely affected by the *Oospora (Achnomyces) scabies* Thax., while the small tubers

showed only a slight infection. Further observations showed that the disease was always more severe at the basal end than in the apical region of the tubers. It would appear that, if the scab disease is to occur, the tuber must be increasing in size; there must be stomata or young unsuberized lenticels present, through which the infection can take place, and there must be meristematic tissue to permit of the production of the typical corky scab lesions.

A brief bibliography is appended.—*A. B.*

Potato Sets. By W. Stuart, P. M. Lombard, M. C. Vosbury, G. Corder, W. C. Edmundson, C. F. Clarke and G. W. Dewey (*U.S.A. Dep. Agr., Bull. 1248*, pp. 1-41; 12 figs.).—The influence of the size of the potato set on the resultant crop has been the subject of frequent research, but the conclusions are conflicting. The authors give an account of the most important of these experiments. Their own researches lead to the conclusion that, under favourable conditions, a larger yield of marketable potatoes is obtained from whole sets than halved, and from halved sets than quarter sets. Further, the number of stems and tubers increase as the set increases in weight from 2 to 6 ounces.—*S. E. W.*

Potato Tip-burn Control. By T. H. Parks and E. E. Clayton (*U.S. Agr. Exp. Sta., Ohio, Bull. 368*, June 1923, pp. 243-258).—The disease causes the premature dying and blackening of the tips and margins of the leaves, and it is transmitted by the potato leaf-hopper insect. 'Early Triumph' is the most and 'Irish Cobbler' the least damaged of the early varieties. 'Green Mountain' resists the disease better than 'Rural.'

Bordeaux mixture was found to be of value as a control for the insect. Four or five applications are suggested.—*A. B.*

Potato Wilt Control. By M. B. McKay (*U.S. Agr. Sta., Oregon, Bull. 221*, March 1926, pp. 1-22).—Wilt is due to *Verticillium albo-atrum* and *Fusarium oxysporum* and causes yellowing and drooping of the lower leaves and ultimately of the whole plant. The disease is carried from plant to plant and remains in the soil. Seed selection and crop rotation are the best means of control. A four-year rotation is suggested.—*A. B.*

Raspberry, Van Fleet. By G. M. Darrow (*U.S.A. Dep. Agr., Circ. 320*, pp. 1-140; 10 figs.).—The 'Van Fleet' raspberry was obtained by fertilizing the Chinese *Rubus innomminatus* with the pollen of the 'Cutthbert' red raspberry. The plant is vigorous and productive, and is the latest variety to fruit. The berries are soft, of medium size, with small seeds. The canes should be tied to a stake projecting 5½ feet above the ground, and are cut off six inches above the stake. This variety is remarkably free from disease. It can be propagated by rooting the tips of the canes in October, or by burying cuttings horizontally one inch deep in sand, if bottom heat is provided.—*S. E. W.*

Raspberry, Winter Pruning the Black. By Stanley Johnston (*U.S.A. Exp. Sta., Mich., Special Bull. 143*, March 1925; 5 figs., 15 tables).—Describes the results of different methods of pruning.—*A. P.*

Root Development. By R. D. Lees (*Agr. Gaz., N.S.W.*, vol. xxxvii, pp. 17-19).—Superphosphate stimulates the roots of wheat, enabling them to penetrate the subsoil quickly and deeply. Fallowing is essential to obtain the best results from superphosphate.—*S. E. W.*

Rose, Brown Canker of. By A. E. Jenkins (*Amer. Rose Ann. 1927*, pp. 161-182).—This disease, which probably occurs in Great Britain, is characterized. Attacked shoots die back or may be girdled and completely killed. The dead bark is at first soft to the touch, but may later become wrinkled, shrunken, and brown. The typical brown colouring of the affected part is generally sharply defined, but it may be surrounded by a purple border. The trouble is first to be seen as small reddish to bluish-purple circular spots on the current year's wood, later becoming whitish. On these the fruit bodies of the causal fungus, *Diaporthe umbrina*, may appear as tiny black spots. Cankers develop in winter and spring as conspicuous bright coloured areas about the white spots. Leaves are attacked, small purple spots developing upon them, and so also are flowers. Spraying with Bordeaux mixture has apparently checked the disease.—*F. J. C.*

Roses, Summer Care of. By S. Mottet (*Jour. Soc. Nat. Hort. Fr.*, ser. 4, vol. xxvii, pp. 93, 94; 1 fig.).—In summer, rose beds require frequent hoeing or, in the case of light soils, mulching with cow dung. When the first blooming is over, withhold water for a time, then give a top dressing of a fertilizer containing

ammonia, nitrate, phosphate and magnesia. This should be scattered on the beds. If a liquid is preferred, dissolve potassium nitrate 1 oz., magnesium nitrate 1 oz., ammonium phosphate 2 oz., in 22 gallons of water, and apply one or two gallons to the square yard once a week. Carefully remove suckers and faded flowers. Summer pruning is resorted to when very late flowers are desired. The grubs of the cockchafer do serious damage to the roots of roses. In summer they are attracted by lettuce leaves. Frequent spraying is the only way of keeping aphides in check. Dusting with flowers of sulphur is the best remedy for mildew, and leaf spot is kept under by copper sprays. Carbosonal, containing sulphur and copper, is said to cure both these diseases.—S. E. W.

Slugs. By W. B. Gurney (*Agr. Gaz.*, N.S.W., vol. xxxvii. p. 108).—Slices of boiled potato covered with a board form a good trap for slugs. Bran mash mixed with Paris Green or potato sprinkled with white arsenic are also recommended.—S. E. W.

Soil Fertility. By H. Wenholz (*Agr. Gaz.*, N.S.W., vol. xxxvii. pp. 27-36, 229-236, and 374-380; 12 figs.).—Soil that has been under cultivation of grain for some time deteriorates in physical condition owing to loss of humus. Green manuring is the remedy. For this purpose leguminous crops are grown and ploughed in or used for grazing. Rye and rape may also be used as cover crops. The soil must be properly prepared and manured for these green manure crops. In the case of leguminous crops, superphosphate must be supplied. Green manuring supplemented by superphosphate is strongly recommended for orchards. The most suitable cover crops for various districts in New South Wales are discussed.—S. E. W.

Stone Fruit Diseases. By D. H. Rose (*U.S. Agr. Dep. Farm. Bull.* 1435, Sept. 1924, pp. 1-26; 6 figs.).—This bulletin gives particulars of the various common diseases of the cherry, the peach, the plum, the apricot, and the nectarine, including the Alternaria rot (*Alternaria* sp.); bacterial spots of peach, plum, cherry, and nectarine (*Bacterium pruni*), the blue mould (*Penicillium* sp.), the brown rot (*Sclerotinia cinerea*), the grey mould (*Botrytis cinerea*), the spot disease of peach (*Coryneum Beijerinckii*), the rhizopus rot (*Rhizopus nigricans*), the scab of peaches (*Cladosporium carpophilum*), and details the various methods of control.—A. B.

Strawberry Diseases. By N. E. Stevens (*U.S. Agr. Dep. Farm. Bull.* 1458, August 1925, pp. 1-10).—Strawberries are largely grown throughout the States, and are subject to various leaf diseases and fruit rots, as well as nematode attacks. Leaf diseases are best controlled by spraying or dusting; fruit rots by proper mulching and careful handling; nematode diseases by a system of rotation.

A. B.

Sugar Beet, Loss in Sugar in. By D. A. Pack (*Jour. Agr. Research*, vol. xxxii. No. 12, June 1926, pp. 1143-1152; 6 tables).—The experiments indicate the importance of moisture in the storage of sugar beets and show that moist-stored sugar beets lose less sugar than similar sugar beets stored in a dry condition. The loss of sugar increases as the dryness increases. Dry storage accelerates, while moist storage retards this loss of sugar. The losses in commercial sugar beets are decreased from 40 to 50 per cent. by moist storage. The specific moisture condition required to reduce this loss to a minimum is a moisture condition in equilibrium to the water content of the beet tissues, and is equivalent to 12 atmospheres osmotic pressure. Sugar beets should be kept alive in storage.

A. B.

Tomato Leaf Spot, The Control of. By F. J. Pritchard and W. S. Porte (*U.S. Dep. Agr. Bull.* 1288, Dec. 1924, pp. 1-20; 9 figs.).—Leaf spot of the tomato is caused by *Septoria Lycopersici* Speg., and causes considerable loss in various States of America. The use of Bordeaux mixture has been given as the most effective control of leaf spot, but modified field practice is suggested. This includes destruction of weeds and old stems. Good stocky plants only should be used and planted out early in the year. The more resistant varieties, 'Marvel,' 'Norton,' and 'Norduke,' should be cultivated in preference to others.—A. B.

Vegetable Plants, Transplanting. By W. E. Loomis (*Agr. Exp. Sta., Cornell Univ.*, Mem. 87, pp. 1-63; 21 figs.).—Transplanting plants saves greenhouse or garden space, but does not directly promote the development of the plant. Transplanting retards development, but does not decrease the total yield. Those plants which are seriously injured by transplanting have normally a rapid top growth and a slow root replacement.—S. E. W.

AWARDS TO SUNDRIES MADE DURING 1925-26.

THESE AWARDS ARE VALID FOR TEN YEARS AND LAPSE IN 1935 OR 1936.

GREASE FOR BANDING FRUIT TREES.

Award of Merit.

1. Grease AB from Messrs. Craven, Evesham (1926).

SPRAYING MATERIALS.

Award of Merit.

2. Insecticide Truffaut from Messrs. G. Truffaut, Versailles, Paris (1925).
3. Lime-sulphur with Calcium Caseinate Spreader from Messrs. Voss, Millwall, E. 14 (1925).
4. A1 Nicotine Wash for use against Aphides from Messrs. Stonehouse & Co., West Bromwich (1926).

Highly Commended.

5. Venetan for use against Aphides both indoors and out from Messrs. Millward's Merchandise Ltd., Manchester (1925).
6. Fruit-tree Spray for winter use from Messrs. The Cargo Fleet Iron Co., Middlesbrough (1926).
7. Special Egg-killing Winter Wash from Messrs. G. Monro, Covent Garden, W.C. 2 (1926).

Commended.

8. Winter Spray Fluid from Messrs. Cooper Nephews, Ltd., Berkhamsted (1925).
9. Soluble Casein Spreader for mixing with Sprays to ensure wetting from Messrs. G. Monro (1925).
10. Carbo-Craven Winter Wash for killing Eggs from Messrs. Craven, Evesham (1926).

Other spraying materials have been received and treated from Messrs. The Antis Manufacturing Co., Mr. A. Ross, Messrs. Corry, M. J. Scheuermeier, Messrs. Voss, Messrs. Stonehouse.

FUMIGATORS.

Fumigating materials have been tried from Messrs. Monro and Messrs. Stonehouse.

SPRAYING APPARATUS.

Award of Merit.

11. Eclipse Sprayer from Messrs. W. Wood, Taplow (1926).

Highly Commended.

12. Pneumatic Knapsack Sprayer Type A.B., from Messrs. Holder Harriden, 1 Chiswell Street, E.C. (1925).
13. Con-o-mist Pneumatic Garden Sprayer from Messrs. Condrup Ltd., 78 Fore Street, E.C. (1926).

Other spraying apparatus has been received for trial from Mr. J. Aston.

LABELS.

Highly Commended.

14. Pottery Label of red tile from Mrs. Torkington, Reading (1925).

Other labels have been received for trial from Messrs. Orbits and Mr. P. Cox.

TOOLS AND APPARATUS.

Highly Commended.

15. Miracle Spade from The Hardy Patent Pick Co., Sheffield (1925).
16. Soil Testing Outfit for ascertaining the Lime Needs of Soils from The British Drug Houses, London, E.C. (1926).

Other tools and apparatus have been received for trial from Messrs. Camp (secateurs), Messrs. Carbic, Ltd. (lamp trap), Mr. Chapman (combination tools), Mr. Dyball (wire clips), Messrs. Ollis (gardening kit), Messrs. Ovalrings (tree fasteners), Mr. W. Sadler (planting tool), Solomides (insect trap), Staket Co. (stakes), Mr. Waldron (fruit tree fasteners), Major Walker (fruit tree protectors), Messrs. Wallwyn Co. (lawn edge trimmer), Mr. Walsh (soil pan breaker).

MOTOR LAWN MOWERS.

The trial of Motor Lawn Mowers and Accessories organized by the Royal Horticultural Society took place on May 13, by kind permission of H.M. Office of Works, in Regent's Park. The arrangements for the reception and safe custody of the machines and the marking out of the ground were in the hands of Mr. Campbell, Superintendent of Regent's Park, to whom our thanks are gratefully tendered. All British firms connected with the manufacture of Motor Lawn Mowers were, with two exceptions, represented.

The judges report that no machine in the trial was mechanically thoroughly unsatisfactory, but some were superior to others, and they recommend that awards should be made as set out in the table below. One of the chief faults noticed is the inadequate silencer provided; another is the extreme lightness of construction shown by some machines; a third, the inadequate protection of engine parts.

The assessment of marks was made by the judges as follows:—

- Mr. F. J. DYKES, for construction of engine, etc.
 Messrs. METCALFE & PETTIGREW, for construction of mower.
 Messrs. CAMPBELL & JORDAN, for work done by the machines.

Two machines were fitted with special cultivators, but as no opportunity occurred in the Park for the adequate testing of this accessory no recommendation was made regarding it.

Award of Merit.

42" Motor Lawn Mower from Messrs. Thos. Green, Ltd., New Surrey Works, Southwark Street, S.E., for use on Sports Grounds and similar areas.

30" Motor Lawn Mower from Messrs. Alexander Shanks & Son, Ltd., Bush Lane House, Cannon Street, E.C., for lawns.

30" Motor Lawn Mower from Messrs. Dennis Bros., Ltd., Guildford, Surrey, for lawns.

24" Motor Lawn Mower from Messrs. Alexander Shanks.

24" Motor Lawn Mower from Messrs. Dennis.

24" Heavy Motor Lawn Mower with trailer seat from Messrs. Thos. Green.

20" Light Motor Lawn Mower with trailer seat from Messrs. Thos. Green.

16" " Wizard " Motor Lawn Mower from Messrs. Shanks for small lawns.

Highly Commended.

30" Atco Motor Mower from Messrs. C. H. Pugh, Ltd., Whitworth Works, Birmingham, for large lawns.

24" Auto-Mower with seat from Messrs. The Auto-Mower Engineering Co., Norton St. Philip, near Bath.

18" Auto-Mower with seat from Messrs. The Auto-Mower Engineering Co.

16" Atco Motor Mower from Messrs. C. H. Pugh, Ltd., for small lawns.

16" Atco Motor Mower with 12 blades and special sole plate from Messrs. C. H. Pugh, Ltd., for very fine lawns.

G. N. Motor attachment for lawn mowers from Messrs. G. N., Ltd., East Hill, Wandsworth, S.W.

Motor Pusher with forecarriage from Messrs. The M.P. Co., Ltd., 550 Oxford Street, W. 1, for pushing lawn mowers, etc.

Rendle Motor Mower Attachment from Messrs. W. Edgecumbe Rendle & Co., Ltd., 5 Victoria Street, S.W., for pushing lawn mowers.
Trailer seat for Motor Mowers from Messrs. Dennis Bros.

Commended.

22" "Governor" water-cooled Motor Lawn Mower from Messrs. John Shaw & Sons, Wolverhampton, Ltd.

22" "New Godiva" Motor Mower from Messrs. The Godiva Engineering Co., Ltd., Trading Estate, Slough, Bucks.

22" Atco Motor Lawn Mower from Messrs. C. H. Pugh, Ltd.

16" Automo Motor Lawn Mower from Messrs. F. Mitchell, Derby Road, Nottingham.

Motor Pusher from Messrs. The M.P. Co., Ltd., for pushing lawn mowers.

EXTRACTS FROM THE PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETING.

JANUARY 12, 1926.

Sir WILLIAM LAWRENCE, Bt., in the Chair.

One hundred and fifty Fellows and one Associate were elected, and four Societies affiliated.

GENERAL MEETING.

JANUARY 26, 1926.

The Rt. Hon. The Lord LAMBOURNE, P.C., C.V.O., V.M.H., in the Chair.

One hundred and twenty-nine Fellows and three Associates were elected, and five Societies affiliated.

ANNUAL GENERAL MEETING.

FEBRUARY 9, 1926.

The Rt. Hon. The Lord LAMBOURNE, P.C., C.V.O., V.M.H., in the Chair.

The Minutes of the last Annual General Meeting were read and signed. One hundred and fifty-nine Fellows and seven Associates were elected, and five Societies affiliated.

The President moved the adoption of the Annual Report of the Council, which had been circulated. The Report was, he said, a record of another extremely successful year, in which the number of Fellows and Associates had risen from about 20,000 to well over 21,000, and since the report had gone to press another 400 Fellows had been elected. On the other hand, the Society had suffered severe losses at the hand of death. In common with all His Majesty's subjects they lamented the passing of Queen Alexandra, a Patron of the Society. They had also suffered a very severe loss in the death of the Secretary, Mr. W. R. Dykes, and the vacancy thus created was naturally a matter requiring and receiving the most careful consideration of the Council. The President then dealt with the progress which had been made with the arrangements for the New Hall, and briefly referred to the work carried out at Wisley. He announced that the Council had been successful in obtaining a site for an Art Tent at Chelsea Show, and in conclusion expressed the Society's thanks to the retiring Members of the Council.

Sir William Lawrence (Treasurer) then made a statement upon the financial position of the Society, outlined the Council's proposals in regard to the finance of the New Hall, and seconded the adoption of the Report.

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At the request of the Chairman, Mr. C. T. Musgrave (Chairman of the Housing Committee) described with the aid of a model the type of building which it was proposed that the New Hall should be, and stated that it was hoped that it would be possible to commence upon the excavation of the site in the course of the next six months.

Having invited questions, the President then put the motion, which was carried unanimously.

As the following nominations had been circulated to all Fellows in accordance with Bye-law 74, and as the number of names proposed did not exceed the number of vacancies, the President declared all the nominees to be duly elected.

<i>As President.</i>	<i>Proposed by</i>	<i>Seconded by</i>
The Rt. Hon. The Lord Lambourne, P.C., C.V.O., V.M.H.	Sir William Lawrence, Mr. C. T. Musgrave, Bt.	

<i>As Treasurer.</i>		
Sir William Lawrence, Bt.	Dr. A. W. Hill.	Mr. E. A. Bowles.

<i>As Members of Council.</i>		
Mr. Mark Fenwick.	Mr. C. G. A. Nix.	The Hon. H. D. McLaren.
Mr. G. W. E. Loder.	Mr. C. G. A. Nix.	Mr. C. T. Musgrave.
Mr. W. R. Oldham.	Mr. E. A. Bunyard.	Mr. W. A. Bilney.

<i>As Vice-Presidents.</i>		
The Duke of Bedford, K.G., F.R.S.	}	
The Duke of Portland, K.G., P.C., G.C.V.O.		
Mr. E. A. Bowles, M.A., F.L.S., V.M.H.		
The Hon. Vicary Gibbs, V.M.H.		
Lieut.-Colonel Sir George Holford, K.C.V.O., C.I.E.		
Sir James Knott, Bt.		The Rt. Hon. The Lord Lambourne.
Sir John T. D. Llewelyn, Bt., D.P., J.P., F.L.S., V.M.H.		The Hon. H. D. McLaren.
Sir Daniel Morris, K.C.M.G., J.P., D.Sc., D.C.L., F.L.S., V.M.H.		
Lieut.-Colonel Sir David Prain, C.M.G., F.R.S., V.M.H.		
Viscount Ullswater, P.C.		
Mr. J. C. Williams.		

<i>As Auditor.</i>		
Mr. Alfred C. Harper.	Mr. C. G. A. Nix.	Dr. A. W. Hill.

The following presentations were then made :—

Victoria Medal of Honour.

To Mrs. W. R. Dykes, the medal awarded to her husband, the late Secretary.
To Mr. William Dicks, the medal awarded to his father, the late Mr. S. B. Dicks.

To Mr. Joseph Rochford.

To Mr. Harry Mount, the medal awarded to his father, Mr. George Mount.

Lawrence Medal.

To Mr. E. A. Bunyard, the medal awarded to Messrs. Geo. Bunyard & Co.

Sander Medal.

To Lieut.-Colonel Sir George Holford, K.C.V.O., C.I.E.

Cory Cup.

To Mr. E. A. Bowles, M.A., F.L.S., V.M.H.

Loder Cup.

To Mr. W. J. Bean, I.S.O., V.M.H.

Mr. Robert Fife then moved : " That this General Meeting is of opinion that the situation and soil of Wisley render it unsuitable for a trial ground, and remits to the Council to endeavour to procure suitable land in a place more easily accessible to visitors and report to a future meeting." Mr. Fife spoke at length in support of his motion, which was seconded by Mr. W. J. Chittenden.

Mr. C. G. A. Nix, who replied on behalf of the Council, stated that whereas Mr. Fife had chosen the Dahlia Trials to illustrate what he (Mr. Fife) considered to be unsatisfactory results, the National Dahlia Society had, as recently as the past three weeks, written to the Council expressing appreciation of these very trials and asking for their extension. The trials were not unfair, and it was quite impossible and wholly unnecessary for the Society to consider any question of abandoning Wisley and finding a new garden elsewhere,

The motion was then put, but it received only the support of the Proposer, Second, and one other Fellow, and was lost.

The meeting concluded with a vote of thanks to the Chairman, proposed by Mr. G. Yeld, and seconded by the Rev. Oliver J. Dunn.

REPORT OF THE COUNCIL FOR THE YEAR 1925.

1. **The Year 1925.**—Once again we have the pleasure to report a year of prosperity. The Society has continued to grow steadily, and since the last Annual General Meeting the number of Fellows and Associates has increased by over one thousand.

2. **Obituary.**—In common with the whole Empire the Society mourns the death of its beloved Patron, Queen Alexandra. Her Majesty always showed great interest in the Society's work, and her love of flowers and gardens was well known. It will be remembered that Queen Alexandra accompanied King Edward when he opened the Hall, and for many years attended the Society's Spring Show.

The Society has sustained a very heavy loss in the death of its Secretary, William Rickatson Dykes, and an appreciation of his work appears on p. 5 of the Book of Arrangements [see also JOURNAL R.H.S. 51, p. 177].

By the death of Field-Marshal Lord Grenfell the Society has lost a great friend and former President. Lord Grenfell consented to become President during the difficult period of the war, and we shall always be grateful to him for his services at that time.

It is with deep regret that we have to record the passing of Arthur Sutton, whose services on the Council and generosity as a Fellow will long be remembered. The lengthy list of Fellows who passed away during the year includes: W. C. Blaxill, Rev. P. Clementi-Smith, Sir Francis Darwin, Mrs. C. W. Earle, Viscount Leith of Fyvie, James S. Gamble, Viscountess Goschen, Sir Everard Hambro, John Heal, Rev. Prof. G. Henslow, Elisha Hicks, T. Jannock, Prof. H. Maxwell Lefroy, Rev. J. Meade-King, Whitpaine Nutting, C. Harman Payne, the Earl of Portsmouth, J. K. Ramsbottom, the Duke of Rutland, W. Watson, and James Whitton.

3. Numerical Progress.—

LOSS BY DEATH IN 1925.				FELLOWS ELECTED IN 1926.			
Life Fellows	..	..	6	Life Fellows	..	..	18
4 Guineas	..	..	2	4 Guineas	..	..	12
2 "	..	..	120	2 "	..	..	1,373
1 "	..	..	105	1 "	..	..	980
			233	Associates	..	..	48
				Affiliated Societies	..	..	64
Loss by Resignation, &c.							
4 Guineas	..	..	6				2,495
2 "	..	..	559	Deaths and Resignations..			1,384
1 "	..	..	491				
Associates	..	..	46	NUMERICAL INCREASE	..	1,111	
Affiliated Societies	..	..	49				
			1,151	Total on November 18,			
TOTAL LOSS	..	..	1,384	1924	..	..	20,767
				Total on November 18,			
				1925	..	..	21,878

4. **Meetings of the Society.**—The Shows held during the year have maintained the high standard of which the Society has long been so justly proud, and have attracted an ever-increasing number of visitors. The trade growers, both great and small, to whom the Society's exhibitions owe so much, have continued in friendly rivalry to stage those excellent exhibits for which they have a world-wide reputation. Not a few amateurs have also contributed to the interest of the Shows by exhibiting either groups or single plants for certificate. Among those of special note might be mentioned the splendid display of Orchids sent by Lieut.-Colonel Sir George Holford on February 10; the well-grown Alpines staged by Mr. Mark Fenwick on March 24; and the remarkable collection of Primulas shown at Chelsea by Lady Aberconway and the Hon. H. D. McLaren.

5. **The New Hall.**—That the Society should outgrow its home is a natural consequence of its continued prosperity. When the present Hall was opened in 1904 the total membership was 8,360 and the existing buildings were then ample for the Society's needs. The number of Fellows, Associates, and Affiliated Societies is now nearly 22,000, and for several years the need for a larger exhibition hall has been obvious.

At the Annual General Meeting in 1924 the Council sought and obtained the authority of the Fellows to acquire a site and erect a new hall. Since then the matter has received the constant attention of the Council and of the Housing Committee appointed to advise it, and it is now possible to report that the Society has obtained the lease of a site in Elverton Street, Westminster, almost adjoining Vincent Square, for a term of 999 years, at a ground rent of £1,300, on which it will be able to erect an exhibition hall nearly twice as large as the existing one. Plans submitted by several architects of repute have been carefully examined and a design prepared by Messrs. Easton & Robertson, of 36, Bedford Square, W.C., has been accepted subject to certain modifications. Special attention has been given to, and expert advice taken upon, the all-important matter of lighting. The requirements of exhibitors have been and are being kept constantly in mind, and in the interests of the Fellows and exhibitors it is proposed to provide a restaurant for use during the Shows.

As soon as the details of the plans have been settled and approved, copies will be placed in the Library, where they will be available for the inspection of Fellows. In order to give Fellows a further opportunity of making themselves familiar with the Council's proposals regarding the new hall, arrangements have been made for a lecture to be given by Mr. J. Murray Easton, A.R.I.B.A., of the firm of Easton & Robertson, the appointed architects, on Wednesday, April 7, at which Mr. C. T. Musgrave, the Chairman of the Housing Committee, will preside.

The Council has proceeded slowly because it considers that no pains should be spared in an endeavour to make the building as suitable as possible for its purpose. So far, there has been little to show for its efforts, but in order to give effect to the resolution passed at the Annual General Meeting in 1924 the Council will in the course of the present year enter into contracts for the excavation of the site and the erection of the buildings.

That the new buildings will entail a heavy expenditure must be clear to all Fellows, and, until the quantities have been got out, it is impossible to give even the roughest estimate of the cost.

6. **The Daffodil Show.**—The Daffodil Show was held on April 15 and 16, and the entries were more numerous than in the previous year, although the competition in some classes was still weak. The schedule has been thoroughly revised for the 1926 Show; several new classes, both for amateurs and market growers, have been added, and, in order to encourage those who have not previously shown, a section for Novices has been introduced.

7. **Chelsea Show.**—The Society's Great Spring Show was an unqualified success. The applications for space were exceptionally numerous, the weather conditions favourable, and the attendance greater than ever. Acting upon suggestions which had been made from time to time the duration of the exhibition was extended to five days, but in accordance with the wishes of the majority of the exhibitors it is proposed to revert to a three-day Show in 1926.

8. **The Amateur Show.**—The Council decided to try the experiment of holding a Show in 1925 exclusively for amateurs, as it was felt that amateurs often hesitated to make small exhibits at the ordinary Shows where they would be surrounded by the large trade groups. The response was gratifying and the number of entries received indicated that the hall would be completely filled. Unfortunately, hot dry weather prevailed during the fortnight immediately preceding the Show, and in consequence many who had entered found themselves unable to exhibit because, when the Show day came, their flowers were past their best. It seems worth while, however, to repeat the experiment, and all amateurs are cordially invited to exhibit at the Show which will be held on June 22, 1926.

9. **The Autumn Show.**—The Great Autumn Show at Holland Park Rink has now become an established feature of the Society's activities. The applications for space for floral groups were very numerous indeed, and the exhibits completely filled the floor of the large hall, to the exclusion of fruit and vegetables, for which special Shows had been arranged. As up to the time of the Show

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few severe frosts had occurred, there was an exceptionally large display of Dahlias and Roses. The attendance was good, and on the first day exceeded that at any Show previously held at the Rink.

10. **The Vegetable Show.**—The Vegetable Show was held in conjunction with the fortnightly Show on September 8, but, owing to various circumstances, the number of entries and the quality of the exhibits was below the average.

11. **The Fruit Show.**—In 1925 the Council reverted to the old arrangement of holding a special Fruit Show. This took place on September 29 and 30, and there was an unusually large display of Apples, but, owing to the poor crops, few Pears.

12. **Deputations.**—In response to invitations the Council sent deputations to the International Spring Flower Show at Haarlem, the Floral Fête at Southport, and the International Flower Show at Edinburgh. The deputations were everywhere received in a most cordial and hospitable manner, and acting under the powers delegated to them they made awards to the most meritorious exhibits.

13. **The Society's Publications.**—Since the Society undertook the publication of Curtis's *Botanical Magazine*, the volumes for 1922, 1923 and 1924 have been published, and it is hoped that the volume for 1925 will be completed very shortly. Messrs. Bernard Quaritch, Ltd., are publishing the new parts on behalf of the Society, and they hope, in future, to issue them regularly every quarter. The earlier volumes up to and including that for 1924 are obtainable from the Society's offices at Vincent Square. The *Botanical Magazine* is invaluable as a work of reference to all lovers of garden plants, and the Council earnestly invites the assistance of the Fellows in its efforts to ensure the continuity of this famous publication.

Steady progress has been made with the revision of the list of plates and illustrations of plants known as Pritzel's "Iconum Botanicarum Index."

A List of Plants which received awards during the period 1911-1924 has been published and also a List of Orchids which received awards during the period 1916-1924. The 1920 edition of "A Selected List of Hardy Fruits" has been exhausted and a new and revised edition has been produced. All three of these publications may be obtained from the Society's offices.

14. **The Masters Lectures.**—These lectures were instituted in 1909 to commemorate that great advocate of "science with practice," Dr. Maxwell T. Masters, F.R.S., F.L.S., and each year some eminent man of science is invited to lecture before the Society upon recent scientific discoveries and their application to practical horticulture. In 1925 the lectures were given on April 7 and June 23 by Prof. J. H. Priestley, of Leeds University, who chose as his subject "Problems of Vegetative Propagation."

15. **The Lindley Library.**—During the year about 500 books and pamphlets have been added to the Library, which contains over 10,000 volumes. Among the new additions which have been purchased are the following:—Waldstein and Kitaibel's "Descriptiones et icones plantarum rariorum Hungariae," Repton's "Fragments on the Theory and Practice of Landscape Gardening," L'Héritier's "Stirpes novae," Drapiez's "Herbier de l'amateur de fleurs," and Pihl and Eirksson's "Svenska fruktsorter." The collection of books on florists' flowers has been greatly strengthened by a considerable number of small but scarce works from the library of the late Mr. Harman Payne.

The work of preparing a complete catalogue of the Library has been greater than was at first anticipated. It is hoped, however, that a new and complete catalogue of all the books in the Library down to the end of 1925 will be ready within the next few months and available to Fellows of the Society at a reasonable price.

16. **Wisley.**—The year 1925 was on the whole favourable to plant growth at Wisley, and most of the newer parts of the Garden have developed well, while the older have maintained their beauty and interest. Considerable damage was done by the storms and floods of the early part of the year. Visitors to the Garden increase in numbers every year now that Fellows are able to reach the Garden by the Kingston-Guildford omnibus service.

17. **Sunday Opening of Wisley.**—The experiment of opening the Garden on Sunday was tried for the first time in 1925 at the request of a considerable number of Fellows. It cannot be said that this fresh opportunity of visiting the Garden

was made great use of except on one or two occasions, but the Council has determined to repeat the experiment in 1926, when the Gardens will be open each Sunday from May 2 to October 10, between the hours of 2 and 6 P.M. only, to those with Fellows' tickets.

18. Staff Changes.—At the beginning of June, Mr. A. Simmonds, who had been for over two years Assistant Director of Wisley, went to our London office as Assistant Secretary, and we desire to put on record our appreciation of the valuable work he accomplished at Wisley. Mr. R. Findlay, lately Superintendent of Greenwich Park, has been appointed as principal officer in the Garden under the Director, with the title of Keeper of the Garden. It is hoped to appoint a principal officer as Keeper of the Laboratory at no distant date. Other changes in the staff have been of a minor nature, and the completion of six new cottages has assisted to make the difficulty of securing sufficient labour less severe.

19. The Wilks Memorial.—Entrance gates in iron and bronze, together with a brick wall, to the designs of Mr. Edward White, V.M.H., have been completed and bear an inscribed bronze tablet: "This gateway is erected to the memory of the Rev. William Wilks, M.A., V.M.H., Secretary, 1888-1920."

The road front of the Laboratory has also been laid out in lawns with dry retaining walls, which, like those on the front of the Laboratory, have been planted with wall plants. It has been found possible to retain the old oak at the entrance which bears so great a resemblance to the tree on the Society's badge and which helped to give the Wisley Estate its old name of Oakwood.

20. The Garden.—Further land has been prepared in Seven Acres and planted with shrubs and flowering trees; the herbaceous border has been replanted and the opportunity taken to increase the number of kinds of plants represented there, and we hope thereby its interest and beauty; the old Rose borders have been taken up and entirely remodelled and varieties which have been selected from the Rose trials for the Wisley Rose Award have been planted; parts of the Rock Garden which needed renovation of soil, etc., after its fourteen years of existence have been replanted; three acres to form a shelter belt along the whole west end of the garden have been purchased, fenced, and for the most part planted with trees; progress has been made in the conversion of the grassy bed at the eastern end of the Rock Garden into an Alpine meadow; the Heath Garden planted in Seven Acres has made excellent progress and now shows Heaths in flower the year through, and also contains a very large number of Brooms and Genistas: the collection of Rose species along the river-bank near the Rose-trial grounds has been further augmented; the beds for bulbs and rather tender plants under the Laboratory walls have proved very attractive.

21. New Chinese Plants.—The Society's share of the seeds collected in 1924 by Capt. F. Kingdon Ward has been received, and large numbers of plants have been raised, some of which will be available for distribution in 1926. Capt. Ward secured highly of some of the Primulas secured.

22. Chilean Expedition.—The Society has a share in an expedition to the Andes in search of plants that may reasonably be expected to be hardy, Mr. Comber being the collector appointed. It is hoped that seeds may be received from him during 1926.

23. Plant Distribution.—The numbers of plants and seeds distributed increase every year, and it is less easy at times to send to Fellows exactly the plants they desire, since chances in the Ballot are spread over a greater number. Every effort is made, however, to meet Fellows' wishes, and they on their part are earnestly asked to assist in making the work of distribution as light as possible by using and filling up completely the form of application which accompanies the Book of Arrangements and list of available plants. Inattention to details on this form entails delay and increased labour and cost to the staff and Society. Every year forms are received without any indication of their source.

24. Trials in 1925.—The trials of Delphiniums, Michaelmas Daisies, Sweet Peas, Broccoli, Second-early Potatoes, Turnips, Early Peas, and Lettuces under glass were completed during the year and the lists of awards have been published. Trials of Daffodils, Nerines, and Lachenalias are in progress. The trial of Pinks suffered from the winter of 1924-25 and it has been determined to repeat it. Arising out of the trials, in addition to the ordinary reports, a detailed account of the Cos Lettuces has been prepared and will appear in our JOURNAL, giving the combined results of several trials made during the past few years,

and showing the characteristics of the several varieties, their uses, and synonyms. This account should show Fellows the best varieties for different purposes and enable them to ascertain, before purchasing, the characters of any stock to which a name has been given. As usual, almost all these trials demonstrated the continued value of some of the old varieties and brought to light excellent new ones.

The Dahlia and Rose trials are on a somewhat different plan from those just mentioned, since they are continued annually. Bearded Irises have now been added on the same plan. They will be judged for the first time in 1926, and the judges and Fellows will be able to see some 800 varieties in bloom between April and mid-June at Wisley. Reports on Dahlias and Roses which are judged solely for value in the garden, with a full account of the method of trial, appear in the Society's JOURNAL, together with a list of Roses growing in the trials at Wisley.

The trials of Raspberries, Gooseberries, and Currants were judged at Wisley during 1925 and Reports of Awards have been published. Mr. Rawes is engaged in the systematic description of fruits, and this will naturally occupy many years if the true classificatory value of the various characters a plant shows is to be estimated. As they become available these descriptions and classifications will be published in the Society's JOURNAL. The trials undertaken in co-operation with the Ministry of Agriculture for the study of new fruits of promise for commercial planting have advanced so that certain varieties of Black Currants and Raspberries have been distributed to sub-stations for extended trial. Many varieties of fruits, both old and new, have been added to the collections at Wisley, for only by forming and maintaining as complete collections as possible can full information be gained. The help of Fellows in completing these and other standard collections in our Gardens will be heartily welcomed.

25. Trial of Motor Lawn-Mowers.—The increase of motor-driven mowers led the Council to organize a test of these machines in 1925. With one exception every British firm making them entered their specialities, and H.M. Office of Works kindly granted the use of Regent's Park for the test, which was carried out in May. The list of awards made has been published and appears in our JOURNAL.

26. Experimental Work.—Experimental work upon various garden problems continues to be carried out on the same lines as heretofore, and results as they become available are published in our JOURNAL. Dr. Darbishire is continuing experiments on green manuring and upon the composition of varieties of Potatoes, and with Mr. Buxton upon the colours of flowers, especially Primroses, and Mr. Buxton and Mr. Simmonds have obtained some interesting results in the breeding of blue Primroses. Mr. Rawes, in addition to the work already alluded to, is continuing experiments on pollination in orchards and on certain aspects of summer pruning. Mr. Dowson has in hand investigations on the stem-rot of Carnations, sclerotial diseases of bulbs, and of Antirrhinums, etc., the die-back disease of Roses and Rubi, and a core-rot disease of Apples. Mr. Wilson has prepared an account of observations and experiments on the relation of insects to fruit pollination, and continues his experiments on eelworm disease of Phlox. He is also investigating the life-history of a beetle attacking Saxifragas, and other insect pests. Mr. Gould is preparing an account of newly introduced Primulas. Numerous experiments have been made with proprietary washes, etc., the results of which are epitomized in the list of Awards to Sundries annually published in our JOURNAL.

An exhibit showing the need of, and methods of providing for, the cross pollination of fruit-trees was put up in the British Government Pavilion at Wembley in 1925, and an exhibit designed to show some of the experimental work at Wisley was again made at our Chelsea Show. Visitors showed a great deal of interest in these exhibits and also made good use of the opportunity of asking advice provided by the Information Bureau at the latter Show.

27. Meteorology and Crops.—The Wisley Meteorological records are now used in connexion with a national scheme for investigating the relation between the weather and the crops. The Ministry of Agriculture has added a recording wind-gauge to the excellently equipped station at Wisley.

28. School of Horticulture.—The School has its full complement of students but still feels the urgent need of a Hostel for their proper accommodation.

The Society has established four Scholarships for young men from private gardens and nurseries, carrying a maintenance allowance of 35s. a week and

tenable at the Society's gardens. Two of these Scholarships were awarded in 1925 and two are available for 1926.

Acting upon the advice of the Board of Examiners, the Council has decided to offer its open Scholarships in future on the results of a special examination designed to test the candidate's ability to profit by a course of instruction in horticulture.

29. The Weekly Broadcast Bulletin.—The preparation of a weekly bulletin to be broadcast from the London Station and another for the Northern Stations has been continued throughout the year. This weekly message brings numerous letters of enquiry and so helps to further the Society's work.

30. Other Work.—The Society's examinations in horticulture have been conducted as heretofore; the number of enquiries on all matters relating to horticulture continues to increase and entails much correspondence, as do the efforts made to bring together gardeners seeking employment and prospective employers; the services of the Society's Garden Inspector are also increasingly sought.

31. The Society's Property.—The Society is responsible for many buildings, and, to avoid the possibility of accumulated dilapidations and the heavy expenditure which they would involve, the Council has appointed Mr. Walter M. Epps, F.R.I.B.A., as Surveyor to the Society. Mr. Epps will regularly inspect all buildings in which the Society has an interest and supervise all repairs.

During the year it has been found necessary thoroughly to overhaul and re-glaze the glass roof of the exhibition hall, an expensive operation which it is hoped will make the roof satisfactory for many years to come.

32. Mrs. Edward Harding's Pæony Cups.—Three cups have been given to the Society by the well-known American amateur, Mrs. Edward Harding, to encourage the cultivation of Pæonies by amateurs in this country. They are to be offered for award in three successive years. The competition for the Cup in 1925 was held on June 9, but only two exhibits were staged. As neither of them seemed sufficiently good, the Cup was withheld. Arrangements have been made which it is hoped will overcome the difficulty of deciding in advance the best time to exhibit Pæonies, and now that interest has been aroused there should be a large number of entries.

33. The Loder Rhododendron Cup.—The Loder Rhododendron Cup is awarded to Mr. W. J. Bean, I.S.O., V.M.H., the Curator of the Royal Botanic Gardens, Kew, for the work he has done in spreading the knowledge of new or rare species and varieties.

34. The Cory Cup.—The Cory Cup is awarded to *Crocus chrysanthus* 'Snow Bunting,' which was judged to be the best new hardy plant of garden origin shown to the Society in the course of the year. This *Crocus* was raised and shown by Mr. E. A. Bowles, M.A., F.L.S., V.M.H., of Myddelton House, Waltham Cross.

35. The Sander Medal.—The Sander Medal is awarded to Lieut.-Colonel Sir George Holford, K.C.V.O., C.I.E., of Westonbirt, Tetbury, Glos, for his exhibit of *Cymbidium* 'Flamingo' *roseum*, which was considered to be the best greenhouse novelty shown to the Society during 1925.

36. The Lawrence Medal.—The Lawrence Medal for the best exhibit staged at the Society's Shows during the year is awarded to Messrs. George Bunyard & Co., of Maidstone, for their exhibit of fruit on September 29 and 30.

37. The Vetch Memorial Trust.—Awards are made as follows:—

Gold Medal—To Mr. E. H. Wilson, M.A., V.M.H., for his introductions to gardens and his books.

Gold Medal—To Mr. W. P. Thomson for his journalistic work in connexion with horticulture.

The following medals and prizes are offered for award in 1926:

Gold Medal—To the amateur who stages the best exhibit of Alpines in pots at the Fortnightly Show on March 23, 1926.

Silver Medal and £5, and Bronze Medal and £2 10s.—To be awarded by a deputation of the Council at the Dundee Centenary Show on August 26, 1926.

X PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

38. **The Victoria Medal of Honour.**—Vacancies in the list of holders of the V.M.H. caused by the deaths of Mr. J. Heal, Mr. Arthur Sutton, Mr. Wm. Watson, and Mr. J. Whitton have been filled by the election of Mr. S. B. Dicks, Mr. W. R. Dykes, Mr. G. Mount, and Mr. J. Rochford.

39. **Retiring Members of the Council.**—The Council desires to record its appreciation of the services of the three members who automatically retire. They are : Mr. E. A. Bowles, M.A., F.L.S., V.M.H., whose unrivalled knowledge of plants is so freely placed at the disposal of all ; Mr. H. B. May, V.M.H., the veteran member whose keen memory of the past has so often assisted the Council in making arrangements for the future ; and Mr. C. T. Musgrave, who, first as Treasurer and more recently as Chairman of the Housing Committee, has been able by his special knowledge of finance and great experience of legal matters to render invaluable service to the Society. The regret which their colleagues feel at the loss of these members from the Council is lessened by the fact that each has consented to remain Chairman of one of the Committees.

40. **The Committees and Judges.**—The Society owes a great debt of gratitude to the members of all its Committees and to its Judges, who give unstintingly of their valuable time to the affairs of the Society. Without their enthusiastic co-operation the Society's work could not be carried on and the Council desires to place on record its hearty appreciation of the services rendered.

41. **The Press.**—The Council desires to thank the Press for the publicity which it continues to give to the Society's activities. The goodwill and friendly criticism of the Press provide a valuable stimulus to the Society's work.

42. **Further Acknowledgments.**—The Council desires to acknowledge very gratefully the gift of a portrait of Mr. H. B. May which now hangs in the Lecture Room ; a further gift of money from Mr. Sewell, of Weybridge, in gratitude for advice received from the Garden staff on his visits to Wisley ; numerous gifts of seeds and plants for the Garden, a full list of which appears in the JOURNAL ; books for the Libraries, both at Vincent Square and at Wisley ; valuable help given by the Lecturers at our Meetings and by writers of articles, reviews, and abstracts for the JOURNAL, and by Mr. T. A. Lawrenson and the Rev. J. B. Hall in the preparation of the Northern Broadcasting Bulletin ; and great assistance given by Mr. Murray Hornibrook upon the rock garden at Wisley.

43. **The Staff.**—Finally, the Council wishes to thank the members of the Society's staff, both at Vincent Square and at Wisley, who, throughout the year, have so loyally and diligently carried out their duties.

Signed on behalf of the Council,
LAMBOURNE,
President.

31st December, 1925.

SCHEDULE OF INVESTMENTS.

31st December, 1925.

			£	s.	d.
5 %	War Loan (1929-1947)	£9,712 10s. 6d.	cost	9,440	2 11
3½ %	War Loan (1925-1928)	£4,998 16s. 0d.	„	4,363	16 9
3½ %	Conversion Loan (1961)	£6,399 12s. 4d.	„	5,000	0 0
3 %	Local Loans	£5,800	„	6,006	16 6
2½ %	India Stock	£186 9s. 9d.	„	109	2 2
3½ %	Dominion of Canada Registered Stock (1930-1950)				
	£2,000		„	2,000	0 0
5 %	London County Stock (1940-1960)	£2,114 0s. 9d.	„	1,781	3 2
2½ %	Metropolitan Consolidated Stock (1919-1949)				
	£3,462 8s. 10d.		„	1,783	6 7
2½ %	Plymouth Corporation Red. Stock (1918-1958)				
	£786 1s. 10d.		„	386	19 7
6 %	Plymouth Corporation Red. Stock (1940-1950)				
	£427 13s. 6d.		„	405	5 3
2½ %	Bristol Corporation Debenture Red. Stock (1957)				
	£2,096 13s. 6d.		„	974	7 9
4½ %	Central Argentine Railway, Limited, Consolidated Preference Stock	£2,800	„	2,907	3 6
4 %	Central Argentine Railway, Limited, Debenture Stock				
	£600		„	537	15 10
5 %	Havana Terminal Railroad Company Mortgage Debenture Bonds	£8,300	„	8,946	0 0
	Mortgage on Freehold	£2,000	„	2,000	0 0
				<u>£46,642</u>	<u>0 0</u>

ON ACCOUNT OF GENERAL RESERVE FUND.

			£	s.	d.
5 %	War Loan (1929-1947)	£19,837 9s. 6d.	cost	19,951	7 9
3½ %	Conversion Loan (1961)	£6,606 17s. 5d.	„	5,049	10 0
London & North Eastern Railway 4 % Debs.,		£5,510	„	4,999	2 3
				<u>£30,000</u>	<u>0 0</u>

Dr.

ANNUAL REVENUE & EXPENDITURE ACCOUNT

	£	s.	d.	£	s.	d.
To ESTABLISHMENT CHARGES—						
Ground Rent	690	0	0			
Rates and Taxes	922	7	9			
Water Rate	80	3	1			
Electric Light	294	17	11			
Gas	121	1	11			
				2,108	10	8
Salaries and Wages	5,272	19	10			
Annuities	52	0	0			
Printing and Stationery	908	10	4			
Publications	360	8	10			
Botanical Magazine, 1922-1925	609	14	8			
Postages	753	11	11			
Fuel	100	17	6			
Professional Fees	210	0	0			
Gratuities	109	5	0			
Repairs and Renewals	112	13	8			
Miscellaneous Expenses	205	4	9			
				8,695	6	6
„ INSURANCES				184	12	4
„ JOURNAL, PRINTING AND POSTAGE				1,821	13	9
„ STAFF PENSIONS	1,051	0	4			
Less contributed by the Staff, as per scheme	281	6	8			
				769	13	8
„ MEETINGS—						
Spring Meeting (Chelsea), not including Office Expenses	4,936	13	8			
Autumn Meeting (Holland Park)	1,089	8	2			
Special Autumn Meeting (Fruit Show)	423	3	9			
Expenses, Floral Meetings and Conferences	326	17	11			
Council, Committee and Deputation Expenses	524	10	9			
Painting Certificates	128	15	6			
				7,429	9	9
„ INSPECTION OF GARDENS				351	4	7
„ PRIZES AND MEDALS—						
Awarded at Society's Meetings				738	14	11
„ CONTRIBUTION TO LINDLEY LIBRARY—						
Purchase of Books	488	15	6			
Contribution to Expenses as per Trust A/c	238	13	10			
				727	9	4
„ SPECIAL EXPENDITURE—						
Pritzel Revision	644	11	9			
Donation Swanley College	105	0	0			
Gardeners' Royal Benevolent Institution	52	10	0			
Royal Gardeners' Orphan Fund	21	0	0			
Contribution to Andes Expedition	50	0	0			
Wembley Guarantee	187	10	0			
Royal Geographical Society (Geogr. Names)	10	0	0			
				1,070	11	9
„ DEPRECIATION—						
Hall Glass Roof, Furniture, and Appliances for Meetings, &c.				405	7	7
„ EXAMINATIONS IN HORTICULTURE—						
Expenses	262	7	9			
Less Fees	187	0	0			
				75	7	9
„ BALANCE carried forward				27,517	19	11
				<u>£51,896</u>	<u>2</u>	<u>6</u>
To WISLEY—						
Capital Expenditure	89	6	0			
Excess of Expenditure over Revenue	9,823	4	4			
				9,912	10	4
„ GENERAL RESERVE FUND				16,000	0	0
„ WEATHER INSURANCE FUND FOR CHELSEA AND OTHER MEETINGS				300	0	0
„ BALANCE, AS PER BALANCE SHEET				1,105	9	7
				<u>£27,517</u>	<u>19</u>	<u>11</u>

FOR YEAR ENDED 31st DECEMBER, 1925.

Cr.

[illegible]

By Balance brought forward	27,517	19	11
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£27.517 19 11

Dr.

VINCENT SQUARE—BALANCE

LIABILITIES.

	£	s.	d.	£	s.	d.
To CAPITAL FUNDS ACCOUNT	50,109	15	2			
Less Fees paid by Fellows now deceased	126	0	0			
	49,983	15	2			
„ LIFE COMPOSITIONS, 1925.	605	17	0			
				50,589	12	2
„ SUNDRY CREDITORS				1,576	16	10
„ SUBSCRIPTIONS, paid in advance				834	4	6
„ GENERAL RESERVE FUND—						
Balance at 31st December, 1924	45,000	0	0			
Added 1925	16,000	0	0			
				61,000	0	0
„ DEPRECIATION AND RENEWALS FUND—						
Balance at 31st December, 1924	6,915	3	10			
Added 1925	405	7	7			
				7,320	11	5
„ WEATHER INSURANCE FUND for Chelsea and other Meetings—						
Balance at 31st December, 1924	1,942	4	9			
Added 1925	500	0	0			
				2,442	4	9
„ LABORATORY PRIZE FUND—						
Balance at 31st December, 1924	11	15	10			
Dividends (Nicholson Memorial Fund)	1	6	8			
				13	2	6
„ WILLIAMS MEMORIAL FUND	94	4	8			
„ MASTERS MEMORIAL FUND	127	19	5			
„ SCHRÖDER PENSION FUND	6	6	8			
„ LINDLEY LIBRARY TRUST	10	0	0			
„ SIR JAMES KNOTT TRUST	120	0	0			
„ VEITCH MEMORIAL FUND	310	7	8			
				668	18	5
„ MRS. EDWARD HARDING CUP FUND				70	5	10
„ GENERAL REVENUE ACCOUNT	54,921	4	0			
„ REVENUE FOR THE YEAR 1925, as per annexed Account	1,105	9	7			
				56,026	13	7

£180,542 10 0

ASSETS.									
	£	s.	d.	£	s.	d.	£	s.	d.
By CAPITAL EXPENDITURE—									
„ HALL AND OFFICES—									
As at 31st December, 1924 .				41,277	13	4			
„ FURNISHING HALL AND OFFICES—									
As at 31st December, 1924 .				2,757	12	1			
„ NEW HALL—									
Expended during 1925 .				150	0	0			
							44,185	5	5
„ FREEHOLD PROPERTY, WISLEY—									
As at 31st December, 1924 .				11,768	16	6			
Add Expenditure, six Cottages .	1,388	11	2						
Less Grant by Guildford Rural District Council .	450	0	0						
							938	11	2
							12,707	7	8
„ APPLIANCES FOR MEETINGS							366	14	3
„ SUNDRY DEBTORS AND PAYMENTS MADE IN ADVANCE							2,758	10	3
„ WEATHER INSURANCE FUND INVESTMENT ACCOUNT									
Balance as at 31st December, 1924 .				1,942	4	9			
Add Cash for Investment				500	0	0			
							2,442	4	9
„ BOTANICAL MAGAZINE STOCK							100	0	0
„ INVESTMENT OF DEPRECIATION AND RENEWALS FUND—									
5% War Loan 1929-47, £4,578 7s. 2d. cost				4,303	12	6			
3½% War Loan 1925-28, £305 5s. 1d.				266	16	6			
3½% Conversion Loan, 1961, £1,057 14s. 8d.				803	11	8			
5% London County Stock, 1940-60, £610 14s. od.				514	12	10			
2½% Metropolitan Consolidated Stock, 1919-49, £1,000 2s. od.				515	5	2			
2½% Plymouth Corporation Redeemable Stock, 1918-58, £225 9s. 4d.				111	6	5			
6% Plymouth Corporation Redeemable Stock, 1940-50, £123 15s. 6d.				117	5	3			
2½% Bristol Corporation Redeemable Stock, 1937, £607 12s. od.				282	13	6			
							6,915	3	10
Add Cash for Investment				405	7	7			
							7,320	11	5
„ WORKING WATER CO.—									
Deposit in respect of laying water mains from Ripley to Wisley Gardens							1,260	0	0
„ EDUCATION CHARTS							40	13	0
„ INVESTMENTS—									
as per Schedule							46,642	0	0
„ GENERAL RESERVE FUND—									
Investments				30,000	0	0			
Cash on Deposit—National Discount Co.				22,000	0	0			
							52,000	0	0
„ TREASURY BILLS							9,907	10	5
„ CASH AT BANK						1,847	0	5	
Less Cash awaiting investment—									
Wisley Depreciation Fund				£130	0	0			
Vincent Square Fund				405	7	7			
Weather Insurance Fund				500	0	0			
							1,035	7	7
							811	12	10
							£180,542	10	0

I have audited the books from which the foregoing Accounts are compiled and certify that they exhibit a true and correct statement of the position of the Society on 31st December, 1925. In the above total of Assets, £180,542 10s. od., are included investments and Cash amounting to a total sum of £7,320 11s. 5d., representing depreciation reserves on account of such matters as roof renewal, hall painting, &c., and these funds are not available for the General Purposes of the Society.

ALFRED C. HARPER, F.C.A., Auditor

(HARPER BROS. & FEATHER, Chartered Accountants),

35 GREAT TOWER STREET, LONDON, E.C. 3.

22nd January, 1926.

Dr. WISLEY GARDENS—ANNUAL REVENUE & EXPENDITURE

	£	s.	d.	£	s.	d.
To SALARIES—						
Wisley Gardens and Research Station				3,892	14	8
„ RATES AND TAXES	178	16	6			
„ WATER RATE	71	18	6			
„ INSURANCES	139	2	11			
„ LABOUR	3,611	10	3			
„ GARDEN IMPLEMENTS	154	2	3			
„ LOAM AND MANURE	91	5	10			
„ REPAIRS	362	11	8			
„ FUEL	785	10	5			
„ PROFESSIONAL FEES	15	15	0			
				<hr/>	5,410	13 4
„ MISCELLANEOUS EXPENSES—						
Garden and Farm	1,307	8	8			
Laboratory	84	10	0			
Trees and Shrubs	281	8	4			
				<hr/>	1,673	7 0
„ STAFF PENSIONS	182	17	5			
Less contributed by Staff, as per scheme	80	7	6			
				<hr/>	102	9 11
„ DEPRECIATION—						
Glass Houses, Plant and Materials	436	5	6			
Motors	249	3	0			
				<hr/>	685	8 6
„ SPECIAL EXPENDITURE—						
Rev. W. Wilks Memorial				491	13	10
				<hr/>	<u>£12,256</u>	<u>7 3</u>

ACCOUNT FOR YEAR ENDED 31st DECEMBER, 1925.

Cr.

	£	s.	d.
By DIVIDENDS AND INTEREST	1,360	3	6
„ PRODUCE SOLD	782	8	5
„ ANALYSIS FEES	32	16	0
„ STUDENTS' FEES	57	15	0
„ CONTRIBUTION BY MINISTRY OF AGRICULTURE—			
On account of fruit-testing station	200	0	0
„ BALANCE, being excess of expenditure over income, carried to			
Revenue and Expenditure Account, Vincent Square	9,823	4	4

£12,256 7 3

Dr.

WISLEY GARDENS—BALANCE**LIABILITIES.**

	£	s.	d.	£	s.	d.
To CAPITAL FUNDS ACCOUNT—						
As at 31st December, 1924	34,960	11	11			
Add Payments by R. H. Society, 31st December, 1925	89	6	0			
				35,049	17	11
„ ENDOWMENT TRUST FUND				23,342	7	11
(The difference between this fund and the Investment account on the Assets side is due to a change in the Investments which was made in 1921.)						
„ DEPRECIATION AND RENEWALS RESERVE FUND—						
As at 31st December, 1924	5,231	19	3			
Added, 1925	130	0	0			
				5,361	19	3

£63,754 5 1

ASSETS.

	£	s.	d.	£	s.	d.
By DWELLING HOUSES—						
As at 31st December, 1924	5,651	17	4			
„ GLASS HOUSES, RANGES, POTTING SHEDS—						
As at 31st December, 1924	5,202	6	0			
„ LABORATORY—						
As at 31st December, 1924	20,623	18	2			
Additions during 1925	45	15	0			
	20,669	13	2			
				31,523	16	6
N.B.—The Hanbury Trust Estate is, under the Trust Deed, vested in the Society only so long as it is in the position to use it as an Experimental Garden. Accordingly the Expenditure on the Estate by the Society is only an Asset so long as the Gardens continue to be used by the Society.						
„ STOCK FUEL						
					200	0 0
„ MOTOR CAR AND LORRY						
	250	3	0			
Less Depreciation	249	3	0			
					1	0 0
„ VALUATION OF PLANT AND LOOSE EFFECTS (as taken by Mr. Chittenden)—						
Gardens and Laboratory	2,115	11	6			
Farm	1,261	18	3			
					3,377	9 9
„ LIBRARY						
					326	4 4
„ INVESTMENT OF DEPRECIATION AND RENEWALS						
RESERVE ACCOUNT—						
5% War Loan, 1929-47	£2,611	2	11 cost	2,507	5	11
3½% War Loan, 1925-28	£395	18	11	„	346	9 0
3½% Conversion Loan, 1961	£515	15	2	„	390	3 0
5% London Cnty. Stk. 1940-60	£785	5	3	„	661	13 6
2½% Met. Cons. Stk. 1919-49	£1,287	9	2	„	662	19 3
2½% Plymouth Cor. Red. Stock, 1918-58	£288	8	10	„	142	1 0
6% Plymouth Cor. Red. Stock, 1940-50	£159	18	4	„	151	12 4
2½% Bristol Cor. Red. Stock, 1957	£795	14	6	„	369	15 3
					5,231	19 3
Add Cash for Investment					130	0 0
						5,361
						19 3
„ ENDOWMENT TRUST FUND INVESTMENTS—						
5% War Loan, 1929-47	£9,350	cost		8,972	7	11
3½% Conversion Loan, 1961	£2,484	4	1	„	2,000	0 0
5% London County Stk., 1940-60	£600			„	505	12 0
3½% London County Cons. Stk.	£135	8	4	„	130	0 0
2½% Met. Cons. Stk., 1919-49	£970			„	499	12 0
6% Ply. Cor. Red. Stk., 1940-50	£30	9	4	„	29	6 4
2½% Ply. Cor. Red. Stk., 1918-58	£400			„	197	1 0
2½% Bristol Cor. Deb. Red. Stk., 1957	£600			„	278	18 6
London & North Eastern Rly. 4% Deb. Stock	£3,500			„	3,535	0 0
Can. Pac. Rly. 4% Per. Cons. Deb. Stk.	£4,632			„	3,890	17 6
Buenos Ayres Gt. S. Rly. 5% Non-Cum. Pf. Sk.	£2,500			„	2,825	0 0
City of Moscow Loan 1912, 4½% Bonds	£6,000			„	100	0 0
					22,963	15 3
(No interest was received during the year on City of Moscow Loan,						
					£63,754	5 1

I have audited the books from which the foregoing Accounts are compiled, and certify that they exhibit a true and correct statement of the position on the 31st December, 1925.

ALFRED C. HARPER, F.C.A., Auditor

(HARPER BROS. & FEATHER, Chartered Accountants),

35 Great Tower Street, London, E.C. 3.

22nd January, 1926.

Dr.

ALFRED DAVIS

Bequeathed to the Society in 1870 for Annual Prizes

	£	s.	d.	£	s.	d.
To Amount of Fund, 31st December, 1924	946	0	3			

	946	0	3			
„ Dividends received 1925				53	7	9

WILLIAMS

Raised by Donations in 1891 in Memory of

	£	s.	d.	£	s.	d.
To Amount of Fund, 31st December, 1924	204	2	5			

	204	2	5			
„ Balance 31st December, 1924				86	5	10
„ Dividends received 1925				7	18	10
				94	4	8

MASTERS

Raised by Donations in 1908 in Memory of Dr. Masters

	£	s.	d.	£	s.	d.
To Amount of Fund, 31st December, 1924	542	17	0			

	542	17	0			
„ Balance 31st December, 1924				127	19	5
„ Dividends received 1925				20	0	0
				147	19	5

NICHOLSON

Raised by Donations in 1908 in Memory of

	£	s.	d.	£	s.	d.
To Amount of Fund 31st December, 1924	180	14	4			

	180	14	4			
„ Dividends received 1925				7	8	8

SCHRÖDER

Provided by Royal Horticultural Society in Memory of the late Baron

	£	s.	d.	£	s.	d.
To Amount of Fund, 31st December, 1924	557	14	6			

	557	14	6			
„ Balance 31st December, 1924				6	6	8
„ Dividends received 1925				20	0	0
				26	6	8

TRUST FUND.

Cr.

or in any other way the Council may determine.

	£	s.	d.	£	s.	d.
By London County 5% Stock, 1940-60, £375	316	0	0			
„ Met. Consd. 2½% do. 1919-40, £610	314	4	0			
„ Plymouth Corpn. 2½% Red. Stk., 1918-58, £200	98	10	6			
„ do. 6% do. 1940-50, £32 7 0	31	2	3			
„ Bristol Corpn. 2½% Deb. Stk., 1957, £400	186	3	6			
	<u>946</u>	<u>0</u>	<u>3</u>			
„ Revenue and Expenditure Account				<u>53</u>	<u>7</u>	<u>9</u>

MEMORIAL FUND.

R. S. Williams towards Prizes and Medals.

	£	s.	d.	£	s.	d.
By East India Railway Co. Annuity, Class B £7	168	0	0			
„ New South Wales Government 4% Inscribed Stock, 1942-62, £36 3s. 1d.	36	2	5			
	<u>204</u>	<u>2</u>	<u>5</u>			
„ Balance in hands of R.H. Society				94	4	8
				<u>94</u>	<u>4</u>	<u>8</u>

MEMORIAL FUND.

towards the Provision of one or more Annual Lectures.

	£	s.	d.	£	s.	d.
By London, Midland & Scottish 4% Preference Stock, £250	290	13	6			
„ London, Midland & Scottish 4% Guaranteed Stock	252	3	6			
	<u>542</u>	<u>17</u>	<u>0</u>			
„ Lectures given				20	0	0
„ Balance in hands of R.H. Society				127	19	5
				<u>147</u>	<u>19</u>	<u>5</u>

MEMORIAL FUND.

George Nicholson for Prizes.

	£	s.	d.	£	s.	d.
By Local Loans, 3%, £31 11s. 0d.	20	1	5			
„ Tasmanian Government 4% Inscribed Stock, 1940-50, £162 4s. 5d.	160	12	11			
	<u>180</u>	<u>14</u>	<u>4</u>			
„ Prizes				6	2	0
„ Wisley Laboratory Prize Fund				1	6	8
				<u>7</u>	<u>8</u>	<u>8</u>

PENSION.

Schröder to pay to Gardeners' Royal Benevolent Institution for one Pension.

	£	s.	d.	£	s.	d.
By Great Western Railway 4% Debenture Stock, £500	557	14	6			
„ Gardeners' Royal Benevolent Institution				20	0	0
„ Balance in hands of R.H. Society				6	6	8
				<u>26</u>	<u>6</u>	<u>8</u>

Dr.**LINDLEY LIBRARY**

	£	s.	d.	£	s.	d.
To Amount of Fund, 31st December, 1924	7,783	15	7			
„ Contribution from R.H. Society, 31st December, 1925	488	15	6			
	<u>8,272 11 1</u>					
To Balance 31st December, 1924				10	0	0
„ Dividends and Donations received 1925				45	9	6
„ Contribution from R.H. Society, 31st December, 1925				238	13	10
				<u>294 3 4</u>		

PRITZEL REVISION

Fund to be raised for the Revision of

	£	s.	d.	£	s.	d.
To Amount of Fund, 31st December, 1924	859	2	2			
„ Contribution by R.H. Society				644	11	9
„ Dividends received 1925				34	3	10
				<u>678 15 7</u>		

SIR JAMES KNOTT

Bequeathed to the Society in 1920 for the purpose

	£	s.	d.	£	s.	d.
To Amount of Fund, 31st December, 1924	600	0	0			
„ Balance, 31st December, 1924				90	0	0
„ Dividends received 1925				30	0	0
				<u>120 0 0</u>		

VEITCH MEMORIAL

For the Encouragement

	£	s.	d.	£	s.	d.
To Amount of Fund, 31st December, 1924	1,673	19	1			
„ Balance in hands of R.H. Society				352	5	2
„ Dividends and Interest received 1925				83	14	0
				<u>435 19 2</u>		

TRUST.

Cr.

	£	s.	d.	£	s.	d.
By London, Midland & Scottish Railway 4% Preference						
Stock, £1,137	1,458	15	7			
„ Value of Library, 31st December, 1924	6,325	0	0			
„ Purchase of Books, 1925	488	15	6			
	8,272	11	1			
By Librarian's Salary				275	0	0
„ Insurance				9	3	4
„ Balance in hands of R.H. Society				10	0	0
				294	3	4

FUND.

Pritzel's Iconum-Botanicarum Index.

	£	s.	d.	£	s.	d.
By India 2½% Stock, £1,367 13s. 6d.	859	2	2			
„ Expenses of Revision, 1925				644	11	9
„ Loan R. H. Society, repaid				34	3	10
				678	15	7

TRUST.

of providing a Scholarship for Wisley Students.

	£	s.	d.	£	s.	d.
By War Loan 5% 1929-47	600	0	0			
„ Balance in hands of R.H. Society				120	0	0
				120	0	0

TRUST FUND.

of Horticulture.

	£	s.	d.	£	s.	d.
By Victorian Government 5% Inscribed Stock	1,354	0	1			
„ War Loan, 5% 1929-47	319	19	0			
	1,673	19	1			
„ Amount distributed				125	11	6
„ Balance in hands of R.H. Society				310	7	8
				435	19	2

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GENERAL MEETING.

FEBRUARY 23, 1926.

Mr. G. W. LEAK in the Chair.

One hundred and forty-nine Fellows and three Associates were elected, and four Societies affiliated.

A lecture on "How the Seedsman obtains his Seeds" was given by Mr. W. F. Giles.

GENERAL MEETING.

MARCH 9, 1926.

Mr. T. HAY, V.M.H., in the Chair.

One hundred and eighty-six Fellows and six Associates were elected, and six Societies affiliated.

A lecture on "Plants of the Canadian Rockies" was given by Mrs. Henshaw.

GENERAL MEETING.

MARCH 23, 1926.

The Rt. Hon. The Lord LAMBOURNE, P.C., C.V.O., V.M.H., in the Chair.

One hundred and fifty-eight Fellows and four Associates were elected, and two Societies affiliated.

GENERAL MEETING.

APRIL 7, 1926.

Mr. C. T. MUSGRAVE in the Chair.

One hundred and twenty-six Fellows and one Associate were elected, and five Societies affiliated.

DAFFODIL SHOW.

APRIL 13, 1926.

CHIEF AWARDS.

The Peter Barr Memorial Cup.

To Mr. W. Poupart.

The Engleheart Cup, for 12 varieties of Daffodils raised by the Exhibitor.

To Mr. P. D. Williams.

The Barr Vase, for 36 varieties of Daffodils.

To Mr. W. B. Cranfield.

Gold Medal, Class 1. 12 varieties of Daffodils.

To Mr. P. D. Williams.

Gold Medal, Class 26. 12 varieties of Daffodils not in commerce.

To Mr. P. D. Williams.

GENERAL MEETING.

APRIL 20, 1926.

Mr. E. A. BOWLES, F.L.S. V.M.H., in the Chair.

One hundred and sixty-four Fellows and one Associate were elected, and four Societies affiliated.

THE RHODODENDRON SOCIETY'S SHOW.

APRIL 27, 1926.

Awards made by a Deputation of the Council.

Gold Medal for Rhododendrons.

To The Lady Aberconway and The Hon. H. D. McLaren.
To Messrs. R. Gill & Son.

GENERAL MEETING.

MAY 4, 1926.

The Rt. Hon. The Lord LAMBOURNE, P.C., C.V.O., V.M.H., in the Chair.

Two hundred and fifteen Fellows and four Associates were elected.

GENERAL MEETING.

MAY 18, 1926.

The Rt. Hon. The Lord LAMBOURNE, P.C., C.V.O., V.M.H., in the Chair.

One hundred and thirty-nine Fellows and two Associates were elected, and one Society affiliated.

CHELSEA SHOW.

MAY 25, 26, and 27, 1926.

Held in the ROYAL HOSPITAL GARDENS, CHELSEA.

The following accepted the invitation of the Council to assist in judging the exhibits:

ALEXANDER, H. G.
BEAN, W. J., I.S.O., V.M.H.
BECKETT, E., V.M.H.
BOSCAWEN, REV. A. T., V.M.H.
BOWLES, E. A., M.A., F.L.S., V.M.H.
BRAGGINS, S. W. McL.
CAMPBELL, D.
CHRISTIE, J. S.
COBB, A. J.
COLMAN, SIR JEREMIAH, BART., V.M.H.
COUTTS, S.
DE VILMORIN, J.
ENGLEHEART, REV. G. H., M.A., V.M.H.
FIELDER, C. R., V.M.H.
FINDLAY, R.
GALSWORTHY, F.
GIBBS, HON. VICARY, V.M.H.
GLEHN, W. G. DE, A.R.A.
GUTTRIDGE, J. J.
HALES, WM., F.L.S.
HALL, SIR A. DANIEL, K.C.B., M.A.,
F.R.S.
HANBURY, F. J., F.L.S., V.M.H.
HARDCASTLE, E.
HARRIS, J. T.
HARROW, R. L.
HEADFORT, MARQUESS OF

HOLLAND, E. J.
HORNIBROOK, M.
IRVING, W.
JORDAN, F.
KRELAGE, E. H.
LUCAS, C. J.
LYTTEL, REV. PROF. E. S.
MCLEOD, J. F.
METCALFE, A. W.
MUSGRAVE, C. T.
PAGE, W. H.
PETTIGREW, W. W.
PILKINGTON, G. L.
ROTHSCHILD, LIONEL DE
SANDER, F. K.
SLOCOCK, W. C., V.M.H.
SMITH, H. H.
STANLEY, LADY BEATRIX
STEVENSON, T.
STEWART, W.
VEITCH, P. C. M., J.P., V.M.H.
WETTERN, H. L.
WHITE, E., V.M.H.
WIGHTMAN, MRS.
WILLMOTT, MISS, F.L.S., V.M.H.
WILSON, G., F.I.S.
WILSON, J.

List of Awards.

CHALLENGE CUPS.

Sherwood Memorial Cup, for the most meritorious group.

To Messrs. Sutton & Sons.

"Daily Graphic" Cup, for the best rock garden.

To Messrs. Pulham & Son.

Cain Cup, for the best exhibit by an amateur.

To Sir Jeremiah Colman, Bt. (gr. J. Collier).

Orchid Challenge Cup, for the best exhibit of Orchids by an amateur on a space not exceeding 60 square feet. Only those may compete who employ not more than three assistants in Orchid houses (including the head gardener).

To H. T. Pitt, Esq.

Sutton Silver Cup, for the best amateur exhibit of Vegetables.

To Baron Bruno Schröder. (gr. E. J. Henderson).

PAINTINGS.

Silver-gilt Grenfell Medal.

To Miss W. M. A. Brooke, for paintings and drawings of flowers and insects.

Silver Grenfell Medal.

To Mrs. N. Blacklock, for water-colour paintings of flowers.

To Mrs. Edith Fisher, for water-colour paintings of gardens.

To Miss E. Savory, for pictures of flowers.

To Miss J. N. Williams, for paintings of gardens and flowers.

FRUIT AND VEGETABLES.

Gold Medal.

To the Hon. Vicary Gibbs (gr. E. Beckett), for vegetables.

Silver-gilt Knightian Medal.

To Baron B. Schröder (gr. E. J. Henderson), for vegetables.

To Messrs. Sutton & Sons, for vegetables.

Knightian Medal.

To the Guild of Blind Gardeners, for vegetables.

Silver-gilt Hogg Medal.

To Messrs. G. Bunyard & Co., for fruit.

To Messrs. Laxton Bros., for Strawberries.

Silver Hogg Medal.

To Messrs. Rivers & Sons, for fruit-trees in pots.

IRISES.

Gold Medal.

To Messrs. Bunyard & Co., for Irises and herbaceous plants.

Silver Cup.

To the Orpington Nurseries Co., for Irises.

Silver-gilt Banksian Medal.

To Messrs. Barr & Sons, for bulbous and other flowering plants.

To Messrs. De Goede Bros., for Irises and Anemones.

Silver Banksian Medal.

To Mr. G. G. Whitelegg, for Irises.

SHRUBS.

Silver Cup.

To Messrs. J. Waterer, Sons & Crisp, for shrubs, Rhododendrons and herbaceous plants.

To Messrs. Hillier & Sons, for ornamental trees and shrubs.

Silver-gilt Flora Medal.

To Messrs. R. & G. Cuthbert, for Azaleas.

To Messrs. M. Koster & Sons, for Rhododendrons.

To Mr. R. C. Notcutt, for Lilacs, Cytisus and other shrubs.

Silver-gilt Banksian Medal.

To Mr. G. Reuthe, for Rhododendrons and other shrubs.

To the Donard Nursery Co., for shrubs.

To Messrs. W. Fromow & Sons, for Japanese Maples.

To Messrs. L. R. Russell, Ltd., for trees and shrubs.

To Mr. Hosea Waterer, for Golden Yews, etc.

To Messrs. W. Cutbush & Son, for trees in tubs.

To Messrs. A. Charlton & Sons, for shrubs.

To Messrs. R. & G. Cuthbert, for flowering shrubs.

Silver Flora Medal.

To Mr. Hosea Waterer, for Azaleas.

To Hollamby's Nurseries, for ornamental trees and shrubs.

To Messrs. J. Cheal & Sons, for ornamental shrubs.

Silver Banksian Medal.

To Mr. T. Lewis, for Rhododendrons.

To Messrs. Robert Green, for Bay Trees.

To Mr. John Klinkert, for topiary work.

Flora Medal.

Hollamby's Nurseries, for conifers.

Banksian Medal.

To Messrs. M. Koster & Sons, for Azaleas.

To Messrs. R. Gill & Son, for Rhododendrons.

ORCHIDS (AMATEUR EXHIBITS).

Silver Cup.

To Sir J. Colman, Bt. (gr. J. Collier), for Orchids.

Silver-gilt Flora Medal.

To H. T. Pitt, Esq., for Orchids.

ORCHIDS (TRADE EXHIBITS).

Gold Medal.

To Messrs. Charlesworth & Co., for Orchids.

To Messrs. J. & A. McBean, for Orchids.

Silver Cup.

To Messrs. Sanders, for Orchids.

To Messrs. Cowan & Co., for Orchids.

Silver-gilt Flora Medal.

To Messrs. Armstrong & Brown, for Orchids.

To Messrs. Stuart Low & Co., for Orchids.

Silver-gilt Banksian Medal.

To Messrs. Flory & Black, for Orchids.

To Messrs. J. Cypher & Sons, for Orchids.

Silver Flora Medal.

To Messrs. Mansell & Hatcher, for Orchids.

xxviii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Silver Banksian Medal.

To Messrs. Sutton Bros., for Orchids.

Flora Medal.

To H. Dixon, Esq., for Orchids.

ROCK GARDENS.

Gold Medal.

To Messrs. Pulham & Son, for rock garden.

Silver Cup.

To B. H. B. Symons-Jeune, Esq., for rock garden.

To Mr. G. G. Whitelegg, for rock garden.

Silver-gilt Flora Medal.

To Mr. H. Brook, for rock garden.

To Messrs. Clarence Elliott, for rock garden.

To Messrs. Hodsons, for rock garden.

Flora Medal.

To Mr. Gavin Jones, for rock garden.

SWEET PEAS.

Silver Cup.

To Messrs. R. Bolton & Son, for Sweet Peas.

To Messrs. Dobbie & Co., for Sweet Peas.

CARNATIONS.

Silver Cup.

To Messrs. Allwood Bros., for Carnations.

To Messrs. Engelmann, for Carnations.

Silver-gilt Banksian Medal.

To Sir Wm. E. Cain, Bt. (gr. C. Moore), for Carnations.

Silver Banksian Medal

To Mr. J. Douglas, for Border Carnations.

Banksian Medal.

To Messrs. Stuart Low & Co., for Carnations.

TULIPS.

Silver-gilt Banksian Medal.

To Messrs. Dobbie & Co., for Tulips.

Silver Flora Medal.

To Mr. H. G. Longford, for Tulips, Pansies, etc.

Flora Medal.

To Messrs. Barr & Sons, for Tulips.

Banksian Medal.

To Messrs. E. Paul & Co., for Tulips.

ROSES.

Gold Medal.

To Messrs. B. R. Cant & Sons, for Roses.

Silver Cup.

To Mr. E. J. Hicks, for Roses.

Silver-gilt Flora Medal.

To Messrs. Chaplin Bros., Ltd., for Roses.

Silver-gilt Banksian Medal.

To Messrs. A. J. Allen & Co., for Roses.

To Mr. G. Prince, for Roses.

Silver Banksian Medal.

To Messrs. F. Cant & Co., for Roses.

Banksian Medal.

To Messrs. E. Paul & Co., for Roses.

To Mr. J. H. Pemberton, for Roses.

FORMAL GARDENS.

Gold Medal.

To Messrs. R. Wallace & Co., for formal garden.

Silver Cups.

To Messrs. Bakers, for formal garden.

To Messrs. Vernon, Bros., for formal garden.

Silver-gilt Flora Medal.

To Messrs. J. Carter & Co., for landscape garden.

To Messrs. J. Cheal & Son, for formal garden.

To Messrs. W. H. Gaze & Sons, for formal garden.

Silver-gilt Banksian Medal.

To Messrs. R. Neal & Son, for formal garden.

To Messrs. Wm. Wood & Son, Ltd., for formal garden.

Silver Flora Medal.

To Mr. E. Dixon, for formal garden.

To Mr. James McDonald, for grass garden.

ALPINE PLANTS.

Silver Cup.

To Messrs. M. Prichard & Sons, for alpine plants.

Silver-gilt Lindley Medal.

To Lady Aberconway and the Hon. H. D. McLaren, for Chinese and Tibetan Primulas, etc.

Silver-gilt Flora Medal.

To Messrs. Oliver & Hunter, for alpine plants.

To Messrs. R. Tucker & Sons, for alpine plants.

Silver-gilt Banksian Medal.

To Mr. Clarence Elliott, for alpine plants and dwarf shrubs.

To Messrs. Bakers, Ltd., for alpine plants.

To Messrs. J. Waterer, Sons & Crisp., for alpine plants.

Silver Flora Medal.

To Messrs. Maxwell & Beale, for alpine plants.

To Messrs. Bowell & Skarratt, for alpine plants.

To Mr. F. G. Wood, for alpine plants.

Silver Banksian Medal.

To Mr. W. E. T. Ingwersen, for alpine plants and dwarf shrubs.

To Messrs. Carter Page & Co., for alpine plants.

Flora Medal.

To Mr. R. V. Rogers, for alpine plants and dwarf shrubs.

To Messrs. W. H. Rogers & Son, for alpine plants.

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To Messrs. J. Cheal & Sons, for alpine plants.
To Mr. H. Hemsley, for alpine plants.
To Messrs. Jean & Trowbridge, for alpine plants.
To Mr. Gavin Jones, for alpine plants.
To Mr. G. Reuthe, for alpine plants.
To Mr. W. Wells, jun., for alpine plants.

Banksian Medal.

To Central Garden Supplies, for alpine plants.
To Messrs. Hodsons, for alpine plants and dwarf shrubs.
To Miss Hopkins, for alpine plants.

MIXED GROUPS.

Gold Medal.

To Messrs. R. Wallace & Co., for shrubs, herbaceous and bulbous plants.
To Messrs. Sutton & Sons, for greenhouse plants.

Silver Cup.

To Messrs. L. R. Russell, for stove plants.
To Mr. H. J. Jones, for Hydrangeas.
To Messrs. Blackmore & Langdon, for Begonias.
To Messrs. G. Jackson & Son, for Clematis.
To Messrs. James Carter & Co., for flowering plants.
To Mr. Amos Perry, for herbaceous plants.

Silver-gilt Flora Medal.

To Messrs. Wm. Cutbush & Son, for group of Roses and Hydrangeas, etc.
To Messrs. M. Pritchard & Sons, for herbaceous plants.
To Messrs. Bees, for herbaceous and alpine plants.
To Mr. Amos Perry, for hardy ferns.

Silver-gilt Banksian Medal.

To Messrs. Stuart Low & Co., for Australian and other greenhouse plants.
To Messrs. W. Artindale & Son, for herbaceous plants.
To Messrs. Carter Page & Co., for Dahlias.
To Mr. G. R. Downer, for Lupins.

Silver Flora Medal.

To Messrs. Storrie & Storrie, for Aquilegias, Polyanthus, and Primroses.
To Messrs. Blackmore & Langdon, for Delphiniums.
To Messrs. Toogood & Sons, for flowering plants.
To Messrs. R. H. Bath, Ltd., for flowering plants.
To Messrs. Bakers, Ltd., for herbaceous plants.
To Mr. W. H. Walters, for miscellaneous flowering plants.
To Messrs. J. Waterer, Sons, & Crisp, for herbaceous plants.

Silver Banksian Medal.

To H. B. Brandt, Esq., for Caladiums.
To Messrs. Godfrey & Son, for herbaceous plants and Pelargoniums.
To Mr. A. Dawkins, for miscellaneous flowering plants.
To Messrs. Watkins & Simpson, for Schizanthus.
To Studley College, for Hydrangeas, etc.
To Mr. G. H. Dalrymple, for Primulas.
To Mr. J. Douglas, for Auriculas.
To Messrs. Wilson & Agar, for herbaceous plants.
To Messrs. Hewitt & Co., for Delphiniums.
To Yokohama Nursery Co., for Japanese dwarf trees.

Flora Medal.

To Messrs. J. Peed & Son, for stove and greenhouse plants.
To Mr. S. Smith, for Cacti and succulents.
To Messrs. Jarman & Co., for Pelargoniums, Centaureas, Violas.
To Mr. G. A. Miller, for herbaceous plants.
To Mr. F. Gifford, for Pæonies.
To Mr. J. C. Allgrove, for herbaceous plants, alpine and shrubs.
To Mr. H. N. Ellison, for Ferns.

Banksian Medal.

- To Messrs. E. Webb & Sons, for greenhouse flowering plants.
 To Mr. R. J. Case, for Pelargoniums and Salvias, etc.
 To the Chalk Hill Nurseries, for herbaceous plants
 To Messrs. B. Ladhams, Ltd., for hardy plants
 To Messrs. Reamsbottom & Co., for Anemones.
 To Messrs. Reamsbottom & Co., for Anemones in the open.
 To Mr. Wm. Yandell, for Violas.

SCIENTIFIC EXHIBITS.

Silver-gilt Grenfell Medal.

To the East Malling Research Station, for exhibit of fruit-trees on different stocks.

To the Royal Botanic Gardens, Edinburgh, for herbarium specimens of new Chinese plants.

To Dr. G. H. Rodman, for photomicrographs of plant hairs.

Silver Grenfell Medal.

To the Rothamsted Experimental Station for illustrations of research on horticultural crops.

To the Royal Botanic Gardens, Kew, for herbarium specimens of new Chinese plants.

Grenfell Medal.

To the Experimental and Research Station, Cheshunt, for exhibit of greenhouse pests.

Vote of Thanks.

To the Imperial College of Science and Technology, for a physiological exhibit.

GENERAL MEETING.

JUNE 15, 1926.

Mr. H. B. MAY, V.M.H., in the Chair.

Two hundred and eighty-two Fellows and seven Associates were elected.

A lecture on "Violas for the Garden" was given by Mr. D. B. Crane.

The Pæony Cup presented by Mrs. Edward Harding was awarded to Mr. W. B. Cranfield.

THE AMATEUR FLOWER SHOW.

JUNE 22, 1926.

Chief Awards.

R.H.S. Silver Cup, For Highest points in Division A.

To Mr. C. H. W. Mander, 13 points.

To Sir William Lawrence, Bt., 13 points.

Daily Telegraph Cup, for Highest points in Division B.

To Mr. G. H. Fisher, 26 points.

Amateur Gardening Cup, for Highest points in Division C.

Mr. F. M. Vokes, 32 points.

Gold Medal.

To Sir Jeremiah Colman, for Orchids.

To Lt.-Col. L. C. R. Messel, for flowering plants and shrubs.

"Gardeners' Chronicle" Medal, for 12 Vases cut sprays of shrubs.

To Col. S. R. Clarke.

VALENCIENNES SHOW.

JUNE 26, 1926.

Awards made by a Deputation of the Council.

Members of Deputation : Sir WILLIAM LAWRENCE, Bt., and Mr. E. A. BUNYARD.

Gold Medal, for Annuals and Sweet Peas.

To Messrs. Vilmorin, Andrieux et Cie, Paris.

Gold Medal, for Rose Garden.

To Messrs. Moser et Fils, Versailles.

Gold Medal, for Orchids.

To Docteur G. Baillion, Gard.

GENERAL MEETING.

JUNE 29, 1926.

Sir FREDERICK KEEBLE, M.A., D.Sc., F.R.S., in the Chair.

Thirty-seven Fellows were elected, and two Societies affiliated.

A lecture on "The Autographs of Plants" was given by Sir J. C. Bose.

SCIENTIFIC COMMITTEE.

JANUARY 12, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and nine other members present.

Mentha aquatica forms.—Mr. Fraser showed a long series of dried specimens of *Mentha aquatica* in the varieties which occur in England, some of which approach *M. citrata* so far as odour goes.

Congested shoot of Horse Chestnut.—Mr. Hay showed a curious growth from a Horse Chestnut in St. James's Park, consisting of a very congested shoot from which numerous short branches had developed, each bearing a large terminal bud, which, however, did not, as might be expected from their appearance, produce flowers. The shoots had grown on a tree that had been earthed up around the bole, and the malformation may have resulted from the disturbance which follows such a practice.

SCIENTIFIC COMMITTEE, JANUARY 26, 1926.

Sir DAVID PRAIN, F.R.S., in the Chair, nine other members and Mr. VAN DE WEYER (visitor) present.

Research in Flower-colour.—Prof. Armstrong raised the matter of desirability of research into floral colours, and after discussion it was unanimously resolved "That the Council be requested to consider the desirability of specific inquiry being entered upon at Wisley in garden and laboratory with colour in flowers, in the first place with the Dahlia."

Various plants.—Mr. Van de Weyer showed a number of forms of *Narcissus Bulbocodium*, including the dwarf var. *nivalis* from rocky ground, the tall late-flowering form with few upright leaves, a dark-coated bulb, and very green base to the flower (this form grows in sea-marshes and is at times covered with sea-water) and the form *conspicuus* from alpine meadows.

Mentha sp.—Mr. J. Fraser showed a number of forms of *Mentha verticillata*, *ovalifolia*, *acutifolia*, and related forms.

SCIENTIFIC COMMITTEE, FEBRUARY 9, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, six other members and Mr. S. POPE (visitor) present.

The late Dr. Bateson.—The Committee heard with very great regret of the death of Prof. W. Bateson, F.R.S., V.M.H., who had been a member of the Committee for many years and who had done so much for the advancement of knowledge of variation and the laws of inheritance. The Committee unanimously decided that a vote of condolence should be sent to Mrs. Bateson.

Fungus on apple.—Mr. A. D. Cotton showed a specimen of *Fomes pomaceus* which at times attacks apples.

Potatoes diseased.—Dr. Voelcker showed specimens of potatoes attacked by brown scab due to *Oomyces scabies*.

SCIENTIFIC COMMITTEE, FEBRUARY 23, 1926.

Sir DAVID PRAIN, F.R.S., in the Chair, and thirteen other members present.

Iris angustifolia.—Mr. Hosking showed the narrow-leaved form of *I. unguicularis* called *I. angustifolia* (*I. cretensis*).

Alchemillas.—Mr. Fraser showed herbarium specimens of *Alchemilla vulgaris*, *A. alchemilloides*, *A. alpina*, *A. minor* of Hudson. He had not found *A. argentea* wild.

Aphylla uniflora.—Sir Wm. Lawrence showed the curious parasitic *Aphylla* (*Orobancha*) *uniflora* in flower which he had raised from seed received from British Columbia last year, sowing the seed among *Sedum acre*.

Fritillaria coccinea.—He also showed *Fritillaria coccinea* flowering. A Botanical Certificate was unanimously recommended for each of these plants.

Crocuses.—Mr. Bowles showed the Cretan form of *Crocus Sieberi*, which differs considerably from the type.

Double Limnanthes Douglasi.—Mr. Shirelock sent a photograph of a double form of *Limnanthes Douglasi* which had occurred in his garden at Leatherhead.

SCIENTIFIC COMMITTEE, MARCH 9, 1926.

Prof. H. ARMSTRONG, F.R.S., in the Chair, nine other members and Mr. Wood (visitor) present.

Chionodoxa crosses.—Mr. Leak showed a number of seedling forms of *Chionodoxa* with large flowers varying from white and nearly pink to lilac and nearly blue. He also showed hybrids between *Scilla bifolia* and *Chionodoxa sardensis*, and between *C. sardensis* and *C. Luciliae*. A Certificate of Appreciation was unanimously recommended to Mr. Leak for his work with these plants.

Terrestrial Orchids.—Mr. Wood of Hayes, Kent, showed a number of plants of various species of Orchis and Ophrys from Southern France grown by him at Hayes, including *Ophrys muscifera*, *O. anthropophora*, *O. muscifera*, *O. arachnoides*, and *Orchis longicornis*.

Menthas.—Mr. J. Fraser showed a series of dried mints allied to *Mentha acutifolia*.

Primrose crosses.—Mr. Hosking showed a cross between the blue Primrose and the blue Polyanthus which gave seedlings of all Primrose form; between *P. elatior* and *P. juliae*, which gave a considerable range of colours; between a large-flowered Polyanthus and *P. juliae*; and between a hose-in-hose Primrose and *P. juliae*, three of which had flowered and proved to be hose-in-hose.

SCIENTIFIC COMMITTEE, MARCH 23, 1926.

Prof. H. E. ARMSTRONG, F.R.S., in the Chair, and nine other members present.

Orobanche ramosa.—Mr. Hales showed examples of the broom-rape, *Orobanche ramosa*, from Greece.

Soldanella attacked by rust.—Mr. Preston showed specimens of *Soldanella* from Cambridge Botanic Garden attacked by the rust *Puccinia Soldanelli*. The plants which had the disease were those which flowered, and it was probably only a coincidence that those which had escaped did not flower.

Leucojum hyemale.—Mr. Worsley showed an example of *Leucojum hyemale* in flower. The plant is a native of Southern France.

Viola septentrionalis, from Algeria, where it must have been introduced, as it is a native of N. America, and a *Fritillaria* collected in Bulgaria were shown. The latter did not appear to agree with any species described from Greece.

SCIENTIFIC COMMITTEE, APRIL 6, 1926.

Sir DAVID PRAIN, F.R.S., in the Chair, and nine other members present.

Fuchsia cuspidata.—Mr. W. Fawcett showed a new species of *Fuchsia*, recently described by Dr. A. B. RENDLE and himself in the *Journal of Botany*, related to *F. dependens* and *F. corymbiflora*.

Primula atricapilla.—Mr. Hosking showed *Primula atricapilla* collected by Capt. F. Kingdon Ward (K.W. 5760). It is a member of the Section *Muscarioides*.

Malformations.—Mr. Preston showed *Fritillaria imperialis* with a leaf continued down the side of the stem and *Ranunculus Ficaria* from a wild habitat with sepaloid petals.

Salices worthy of cultivation.—Mr. J. Fraser showed specimens of *Salices* which he considered worthy of cultivation, viz. *S. babylonica* × *fragilis* (from Hershams), *S. babylonica* × *alba* (from Mitcham), *S. daphnoides* ♂, *S. pruinosa* ♂, *S. mutabilis* (*gracilistyla*), *S. incana* (*rosmarinifolia*), and *S. Bockii*.

Cupressus × *Leylandii*.—Mr. C. J. Leyland exhibited a hybrid between *Cupressus nothkatensis* and *C. macrocarpa*. It is described in the *Kew Bulletin*, pt. 3, 1926, with a figure, and occurred as a seedling in Mr. Leyland's garden. A Botanical Certificate was unanimously recommended for this plant.

SCIENTIFIC COMMITTEE, APRIL 20, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and eleven other members present.

Various plants.—Mr. Marsden Jones showed *Delphinium macrocentron*, a native of Kenya; a virescent primrose found wild in Dorset; *Cheiranthus versicolor* \times *C. Allionii*, the seedlings of which all had dark buds; *Pulmonaria angustifolia* in two or three forms; *Saxifraga rosacea* \times *S. granulata* (the former being the seed-parent). This cross or a nearly related one has occurred naturally in the Harz Mountains.

Dieback in Roses.—Mr. Preston showed shoots of roses attacked by dieback, due in all probability to the fungus *Botrytis cinerea*.

Double-spathed Richardia.—He also showed on behalf of Mr. Wood a specimen of *Richardia aethiopica* with two white spathes.

British Dianthi.—Mr. J. Fraser showed specimens of *Dianthus Armeria*, *D. deltoides*, *D. Caryophyllus*, *D. caesiuss*, and *D. plumarius* from British sources.

Lysichiton camtschatcense.—Fine examples of this curious and showy Aroid came from Miss Waterer of Long Rock, Cornwall.

SCIENTIFIC COMMITTEE, MAY 4, 1926.

Dr. A. W. HILL, M.A., F.R.S., in the Chair, two other members and Mr. VAN DE WEYER (visitor) present.

Double-spathed Anthericum.—Mr. L. R. Russell sent an example of the seedling *Anthericum Scherzerianum* which he has called *bi-spathum*, which produces two spathes at the apex of each stalk.

Fasciated Tulip.—Miss Edith Beck of Billingshurst sent a fine example of a fasciated Tulip in which the common stalk separated about a foot below the flowers, each of the two branches bearing a well-developed flower on stalks of equal length.

SCIENTIFIC COMMITTEE, JUNE 15, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and seven other members present.

Various plants.—Mr. J. Fraser showed examples of *Mertensia maritima* from Banffshire and Argyllshire, *Lathyrus Nissolia* collected in Surrey and the Isle of Wight, and *L. Aphaca* collected in Surrey and Glamorgan.

Seeds germinating in fruit.—Mr. F. Wood showed *Skimmia japonica* fruits still attached to the bushes and containing germinating seeds, an occurrence found in other Rutaceae.

Orchids.—Mr. Percy Bunyard sent forms of *Orchis incarnata*, *Platanthera bifolia*, and *Habenaria Conopsea*.

Drosophyllum lusitanicum.—Two specimens of this insectivorous plant with fruit ripening were shown by Mr. Russell.

Seedling Cistus florentinus.—Sir Oscar Warburg showed a curious, almost prostrate, seedling of *Cistus* \times *florentinus* with reddish buds. The flowers could not be seen, as, in common with so many of the plants of this genus, they had dropped very early.

Exhibit of Cistus species.—Attention was drawn to the comprehensive exhibit of species of *Cistus* made by Sir Oscar Warburg in the Hall on this day, and it was unanimously recommended that a Certificate of Appreciation should be awarded to Sir Oscar for his work on the plants of this genus.

Oxalis vespertiliooides.—Mr. Hosking showed a plant of this well-known species.

Dicentra chrysantha.—A flowering shoot of *Dicentra chrysantha*, grown by Mr. Hay, was shown by Mr. Loder, to draw attention to some peculiarities of nomenclature into which Mr. Cotton undertook to look.

The late Mr. Bennett Poë.—The Committee heard with deep regret of the death of one of its vice-presidents, the late Mr. J. T. Bennet Poë, and unanimously desired that their expression of sympathy should be sent to his brother, Captain J. Hill Poë.

SCIENTIFIC COMMITTEE, JUNE 29, 1926.

SIR DAVID PRAIN, F.R.S., six other members and Mr. VAN DE WEYER (visitor) present.

Many-leaved clover.—Dr. Voelcker showed several specimens of the red clover which Messrs. Sutton are working upon, a strain with about 50 per cent. of the leaves with five leaflets, the number varying from 3 to 7.

Mildew on grass.—He also drew attention to the incidence of Erysiphe upon grasses in some experimental cultures at Woburn, remarking that the plants which were weakest were the only ones to be attacked.

Cooperanthes × *alipurensis*.—This hybrid, raised by Mr. Lankester of Alipur, and shown by Sir William Lawrence, was unanimously recommended a Botanical Certificate.

Orobanche crenata.—An almost white species of *Orobanche* from Portugal, parasitic upon broad beans, raised from seed sown this spring with the broad beans, was shown by Mr. Van der Weyer. The beans, to the roots of which it attaches itself, were killed, as they are in the Portuguese fields. To this also a Botanical Certificate was recommended.

Currant attacked by Mosaic.—Mr. Van de Weyer showed a shoot of red currant with mottled markings upon the leaves, which were also reduced in size. Such plants rarely recover their normal character.

Coris monspeliensis.—Mr. Van de Weyer also showed the curious heath-like Primulaceous plant, *Coris monspeliensis*, which he had grown from seed collected in the South of France.

Virescent clovers.—Mr. Fraser showed several specimens of *Trifolium repens* and *T. hybridum* with malformed heads, showing various degrees of virecence, which he had found growing by the wayside on a new road near Epsom. The soil was clay, and on it he had found the following Leguminous plants: *Trifolium repens*, *T. hybridum*, *T. hybridum elegans*, *T. pratensis*, *T. minus*, *T. procumbens*, *Vicia sativa*, *V. angustifolia*, *V. hirsuta*, *V. tetrasperma*, *V. Cracca*, *Lathyrus Nissolia*, *L. pratensis*, *Melilotus altissima*, *M. alba*, *M. indica*, *Lotus uliginosus*, *L. corniculatus*, and *Medicago sativa*.

Doubling in Orchis Morio.—A specimen was sent by Mrs. Anson, collected in Sussex and showing the following characters: The scape carried twelve flowers, each of which was abnormal. The flower examined was characterized by the following points:—

1. The three outer perianth segments (sepals) were almost normal, but the purple colour was poorly developed.

2. Of the three inner segments (petals) the labellum (lip) was paler than usual and veined with green, the spur being much reduced. Each of the remaining segments was heavily veined with green.

3. Examination of the ovary revealed no trace of ovules. It is interesting to note in this connexion that the twisting of the ovary which normally inverts the Orchis flower had not occurred in any of the flowers.

4. The column which should carry the anther and stigma was absent, and in its place the axis of the flower had extended to form a short-branched stalk. Each of the four branches bore a large number of small purplish leaves, some spotted like the lip, and others veined like the sepals of a normal flower.

FRUIT AND VEGETABLE COMMITTEE.

JANUARY 12, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and six other members present.

Awards Recommended :—

Silver-gilt Hogg Medal.

To Messrs. Geo. Bunyard, Maidstone, for collection of Apples.

Silver-gilt Knightian Medal.

To Messrs. Sutton, Reading, for collection of vegetables.

Apple 'Saltcote Pippin,' sent by Mr. F. H. Chapman, Rye, was recommended for inclusion in the Commercial Fruit Trials at Wisley.

Other Exhibits.

Mr. G. D. Harvey, Ashburton : Apple 'Golden Harvey.'

Mr. F. Fitzwater, Weybridge : Apple 'High View Pippin.'

Messrs. Westmacott, London : preserves.

Miss H. G. Sewell, South Kensington : preserves.

Mrs. Miller, Marlow : preserves.

Mrs. Fleming, Uxbridge : preserves.

Pickering Cottage Preserves, Loose : preserves.

FRUIT AND VEGETABLE COMMITTEE, JANUARY 26, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver Hogg Medal.

To Messrs. Cheal, Crawley, for collection of Apples.

Other Exhibits.

Messrs. Geo. Bunyard, Maidstone : Apples in season.

Messrs. Westmacott, London : preserves.

Pickering Cottage Preserves, Loose : preserves.

Miss H. G. Sewell, South Kensington : preserves.

Mrs. Miller, Marlow : preserves.

Mrs. Fleming, Uxbridge : preserves.

FRUIT AND VEGETABLE COMMITTEE, FEBRUARY 9, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Gold Medal (votes unanimous).

To Messrs. J. C. Allgrove, Langley, for collection of Apples.

Silver-gilt Hogg Medal.

To Messrs. Geo. Bunyard, Maidstone, for collection of Apples.

To Messrs. T. Rivers, Sawbridgeworth, for Oranges in pots.

Silver Hogg Medal.

To Commendatore Cecil Hanbury, M.P., La Mortola, Italy, for collection of Citrus Fruits.

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Other Exhibits.

Mr. J. Berry, Wootton : Apple 'William Jesse.'
Messrs. W. J. Brown, Stafford : Apple 'Oakham Seedling.'
Mr. F. G. Gerrish, Worcester : Apple 'Lord Hindlip.'
Messrs. Laxton, Bedford : Apple 'Laxton's Superb.'

FRUIT AND VEGETABLE COMMITTEE, FEBRUARY 23, 1926.

Mr. J. CHEAL, V.H.M., in the Chair, and sixteen other members present.

Other Exhibits.

Gold Medal (votes unanimous).

To Messrs. Geo. Bunyard, Maidstone, for collection of Apples.

Silver Knightian Medal.

To Messrs. Sutton, Reading, for collection of Potatos.

Other Exhibit.

Mr. P. C. M. Veitch, Exeter : Apple 'American Mother.'

FRUIT AND VEGETABLE COMMITTEE, MARCH 9, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and nineteen other members present.

No awards were recommended on this occasion.

Exhibits.

Hon. Vicary Gibbs, Aldenham House, Elstree : Apple 'Royal Late Cooking.'
C. Evans, Esq., Redhill : Apple 'Chas. Evans.'
Messrs. Geo. Bunyard, Maidstone : Apples in season.
Mr. T. E. Waltham, London : models of fruit.
R.H.S. Garden, Wisley : collection of Rhubarb.

FRUIT AND VEGETABLE COMMITTEE, MARCH 23, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and eleven other members present.

No awards were recommended on this occasion.

Exhibits.

Messrs. Dobbie, Edinburgh : collection of Potatos.
Hon. Vicary Gibbs, Aldenham House, Elstree : collection of Rhubarb, and
Jerusalem Artichoke 'Fuseau.'
(Rhubarb 'The Streeter' recommended for trial at Wisley.)

FRUIT AND VEGETABLE COMMITTEE, APRIL 7, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and nine other members present.

No awards were recommended on this occasion.

Exhibits.

Hon. Vicary Gibbs, Elstree : Jerusalem Artichoke 'Fuseau' (recommended
for trial at Wisley), and Rhubarb 'The Streeter.'
Mr. W. J. Poupart, V.M.H. : collection of Rhubarb.

FRUIT AND VEGETABLE COMMITTEE, APRIL 20, 1926.

Mr. J. CHEAL, V.M.H., in the Chair, and twelve other members present.

There was no business before the Committee on this occasion.

FRUIT AND VEGETABLE COMMITTEE, MAY 4, 1926.

Mr. E. A. BUNYARD in the Chair.

No award was recommended on this occasion.

Exhibit.

Mr. R. W. Sibthorp, Lincoln : Apple ' Canwick Seedling.'

FRUIT AND VEGETABLE COMMITTEE, MAY 25, 1926.
AT CHELSEA.

Mr. A. H. PEARSON, V.M.H., in the Chair, and twenty-four other members present.

There was no business before the Committee on this occasion.

FRUIT AND VEGETABLE COMMITTEE, JUNE 15, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and eleven other members present.

There was no business before the Committee on this occasion.

FRUIT AND VEGETABLE COMMITTEE, JUNE 29, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and nine other members present.

No award was recommended on this occasion.

Exhibits.

Hon. Vicary Gibbs, Aldenham House, Elstree : Rhubarb ' The Streeter.'

Mr. F. Walker, Launceston, Tasmania : Apple ' Lalla.'

FLORAL COMMITTEE.

JANUARY 12, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Hon. Vicary Gibbs, Elstree, for Poinsettias.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Engelmann, Saffron Walden, for Carnations.

Banksian Medal.

To Messrs. S. Low, Bush Hill Park, for Carnations and other greenhouse plants.

Award of Merit.

To Chrysanthemum 'Winton' (votes unanimous), from Messrs. Tacon & Horwood, Cheshunt. A good deep yellow Decorative variety of excellent form. It is a sport from 'December Bronze.'

Other Exhibits.

R. A. Foster-Melliar, Esq., Bude : Freesias.

Messrs. Gill, Falmouth : Anemones.

Misses Hopkins, Shepperton : hardy plants.

Section B.

Mr. C. T. MUSGRAVE in the Chair, and fourteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Cutbush, Barnet, for rock garden and shrubs.

To Messrs. Russell, Richmond, for shrubs.

To Messrs. Waterer Sons & Crisp, Twyford, for shrubs, alpine plants, Irises, etc.

Banksian Medal.

To Messrs. Cheal, Crawley, for shrubs and alpine plants.

To Mr. F. G. Wood, Ashted, for rock garden.

Award of Merit.

To *Dombeya Glandeliae* (votes 8 for, 1 against), from Lady Glanely (gr. Mr. J. Bannerman), Chippenham. A beautiful and very uncommon greenhouse tree or shrub from Madeira. The handsome light-green leaves are ovate, with three acutely acuminate lobes, toothed and ciliate, palmately nerved and deeply cordate at the base. The largest measure a foot across. The small, bright pink flowers are crowded into dense heads, which hang down on pale-green stalks about eight inches long.

Other Exhibits.

Messrs. Klinkert, Richmond : clipped Box-trees.

Messrs. R. Veitch, Exeter : *Iris unguicularis speciosa*.

FLORAL COMMITTEE, JANUARY 26, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and twenty-two other members present.

Awards Recommended :—*Gold Medal.*

To Messrs. Sutton, Reading, for forced bulbs.

Silver-gilt Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for Cyclamen.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Carter, Raynes Park, for Primulas, etc.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Mr. E. J. Hicks, Hurst, for Roses.

To Messrs. S. Low, Bush Hill Park, for Carnations and other greenhouse plants.

Banksian Medal.

To Messrs. Gill, Falmouth, for Anemones.

Section B.

Mr. G. W. E. LODER in the Chair, and eight other members present.

Awards Recommended :—*Silver Banksian Medal.*

To Messrs. Waterer Sons & Crisp, Twyford, for shrubs and alpine plants.

Banksian Medal.

To Messrs. Barr, Covent Garden, for shrubs and alpine plants.

To Messrs. Cheal, Crawley, for shrubs and alpine plants.

To Messrs. Gill, Falmouth, for Rhododendrons.

To Messrs. L. R. Russell, Richmond, for forced shrubs.

To Messrs. Tucker, Oxford, for alpine plants.

To Mr. F. G. Wood, Ashted, for shrubs and alpine plants.

Award of Merit.

To *Strelitzia* \times *hewensis* (votes unanimous), from the Royal Botanic Gardens, Kew. An interesting warm greenhouse plant raised as the result of a cross between *S. Reginae* and *S. augusta*. It has huge leaves, nearly four feet long and two feet broad. The flower-spike is large and the flowers are light honey-yellow and blue-purple. The plant was raised at Kew, and flowered first in 1910.

Other Exhibits.

Messrs. Cutbush, Barnet : rock garden.

Misses Hopkins, Shepperton : hardy plants.

Mr. Klinkert, Richmond : clipped Box-trees.

Sir William Lawrence, Bt., Dorking : *Fuchsia serratifolia*, a tender species grown in the Isles of Scilly.

Messrs. Skelton & Kirby, Pirbright : shrubs.

W. van de Weyer, Esq., Dorchester : *Narcissus Bulbocodium conspicuus*,

N. Bulbocodium Mt. Estoril, *N. Tazetta papyraceus lusitanicus*, all from Portugal.

Mr. G. G. Whitelegg, Chislehurst : alpine plants.

xlii PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

FLORAL COMMITTEE, FEBRUARY 9, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and twenty-two other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Mr. E. J. Hicks, Hurst, for Roses.

To Messrs. Sutton, Reading, for Primulas.

Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Messrs. S. Low, Bush Hill Park, for Carnations and other greenhouse plants.

Other Exhibits.

Messrs. H. Chapman, Rye : Freesia ' Jollity.'

Messrs. Gill, Falmouth : Anemones.

Miss E. Heathcote, Williton : Violets.

Mr. J. J. Kettle, Corfe Mullen : Violets.

Mr. G. Prince, Oxford : Roses.

Section B.

Mr. C. T. MUSGRAVE in the Chair, and thirteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Barr, Covent Garden, for shrubs and alpine plants.

To Messrs. Cutbush, Barnet, for rock garden and shrubs.

To Messrs. Gill, Falmouth, for Rhododendrons.

To Mr. G. Reuthe, Keston, for shrubs and alpine plants.

To Messrs. Waterer Sons & Cresp, Twyford, for shrubs and alpine plants.

Banksian Medal.

To Messrs. Chaplin, Waltham Cross, for Camellias.

To Messrs. Cheal, Crawley, for shrubs and alpine plants.

To Messrs. C. Elliott, Stevenage, for alpine plants.

To Messrs. Pritchard, Christchurch, for alpine plants.

To Messrs. Russell, Richmond, for forced shrubs.

To Messrs. Tucker, Oxford, for alpine plants.

To Messrs. Wallace, Tunbridge Wells, for shrubs and alpine plants.

To Mr. F. G. Wood, Ashted, for shrubs and alpine plants.

Award of Merit.

To *Cyrtanthus lutescens* (votes unanimous), from Mrs. Frank Platt Barlow, London. A greenhouse bulbous plant from the Cape. Its bright-yellow narrow tubular flowers are very sweetly scented and are borne in bunches of from four to six. The corolla at the top of the tube has six small segments and the short filaments are inserted in the tube. The leaves are narrow, linear, and acuminate.

To *Lindenbergia grandiflora* (votes 10 for), from the University Botanic Gardens, Cambridge. A good greenhouse plant from the Himalayas. It is a much-branched, pubescent plant, growing about 2 feet 6 inches high. The bright-yellow Mimulus-like flowers with campanulate calyces are borne freely in loose leafy spikes. The broadly ovate opposite acuminate leaves are coarsely serrated.

To *Mutisia Clematis* (votes unanimous), from Lt.-Col. Messel, Handcross. A very interesting woody cool-greenhouse plant from Peru and Colombia. It has evergreen pinnate leaves, the short-stalked leaflets being oblong-lanceolate and woolly underneath. The bracts of the involucre are ovate-lanceolate in shape. The bright-red ray florets which terminate the long, pendulous flower heads are recurved.

To *Rhododendron* 'Pink Delight' (votes 12 for), from Messrs. Gill, Falmouth. A good seedling from *R. arboreum*. The flowers are wide-open and white edged with deep rose-pink. They are borne in compact, medium-sized trusses of from 12 to 14 blooms. The leaves are narrow and dark green, covered with brown tomentum underneath.

Other Exhibits.

Lady Aberconway and Hon. H. D. McLaren, Bodnant: *Rhododendron pachytrichum* 'Rose Pink' variety.

Messrs. Baker, Wolverhampton: shrubs and alpine.

Mr. Braggins, La Mortola, Ventimiglia, Italy: *Nandina domestica* and *Cotoneaster angustifolia* in fruit; *Echeveria multicaulis* cut from the open after 13 degrees of frost; *Aloe arborescens natalensis*, the best of this section, in flower from Christmas to March; *Aloe spinosissima*, the best of the dwarf kinds, flowering from January to April; *Cotyledon macrantha*; *Acacia Hanburyana*, perhaps the best of the early-flowering section, free-flowering, good habit, silvery leaf, has stood 13 degrees of frost.

Misses Hopkins, Shepperton: rock garden.

L. Johnston, Esq., Campden: *Ranunculus calandrinoides*.

Mr. Klinkert, Richmond: clipped Box-trees.

Messrs. Maxwell & Beale, Broadstone: Heaths.

Rev. H. R. Meyer, Watton: Iris 'Cantab.'

Messrs. Skelton & Kirby, Pirbright: Forsythias and other plants.

FLORAL COMMITTEE, FEBRUARY 23, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and twenty-two other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Sutton, Reading, for Cyclamen.

Silver-gilt Banksian Medal.

To Messrs. Carter, Raynes Park, for Crocus-lawn.

To Messrs. Allwood, Haywards Heath, for Carnations.

Silver Banksian Medal.

To Messrs. Dobbie, Edinburgh, for Cinerarias.

To Mr. E. J. Hicks, Hurst, for Roses.

To Messrs. S. Low, Bush Hill Park, for Carnations and other greenhouse plants.

To Napsbury Mental Hospital, St. Albans, for Cyclamen.

Banksian Medal.

To Mr. J. W. Barr, Wimborne, for Anemones.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Mr. G. A. Miller, Wisbech, for hardy plants.

To Mr. G. Prince, Oxford, for Roses.

Other Exhibit.

Mr. J. J. Kettle, Corfe Mullen: Violets.

Section B.

Mr. C. T. MUSGRAVE in the Chair, and fourteen other members present.

Awards Recommended —

Silver Banksian Medal.

To Messrs. Barr, Covent Garden, for shrubs and alpine plants.

To Messrs. Cutbush, Barnet, for rock garden and shrubs.

To Messrs. Gill, Falmouth, for *Rhododendrons* and *Primulas*.

To C. G. Kirch, Esq., Beckenham, for alpine plants in pans.

To Messrs. Prichard, Christchurch, for alpine plants.
 To Mr. G. Reuthe, Keston, for shrubs and alpine plants.
 To Messrs. Russell, Richmond, for forced shrubs.
 To Messrs. Waterer Sons & Crisp, Twyford, for shrubs and alpine plants.

Banksian Medal.

To Messrs. Baker, Wolverhampton, for shrubs and alpine plants.
 To Messrs. Cheal, Crawley, for shrubs and alpine plants.
 To Messrs. Elliott, Stevenage, for alpine plants.
 To Mr. Hemsley, Crawley, for shrubs and alpine plants.
 To Mr. Gavin Jones, Letchworth, for alpine plants.
 To Rev. H. R. Meyer, Watton, for Irises.
 To Messrs. Skelton & Kirby, Pirbright, for shrubs and alpine plants.
 To Messrs. Rogers, Southampton, for shrubs and alpine plants.
 To H. J. Talbot, Esq., Uxbridge, for *Paeonia Moutan*.
 To Messrs. Tucker, Oxford, for alpine plants.
 To Messrs. Wallace, Tunbridge Wells, for shrubs.

First-Class Certificate.

To *Crocus Sieberi versicolor major* (votes unanimous), from E. A. Bowles, Esq., V.M.H., Waltham Cross. For size, vigour, and colour this is the best seedling yet raised of this Cretan variety. The outer segments are purple outside with a narrow white band at the top and white inside. The inner segments are all white, and the beauty of the flower is very greatly enhanced by the bright reddish-orange stigmata.

Award of Merit.

To *Cyrtanthus O'Brienii* (votes unanimous), from Sir William Lawrence, Bt., Dorking. A greenhouse bulbous plant from South Africa with bright-salmon tubular flowers, slightly larger than but similar in form to those of *C. lutescens*, which received an award at the last meeting.

To *Primula Allionii alba* (votes 10 for), from Messrs. C. Elliott, Stevenage. A dainty alpine for the rock garden or the alpine-house. It is a native of the Maritime Alps, and bears white flowers, $\frac{1}{2}$ inch in diameter, on very short stems, close to rosettes of small spatulate leaves.

To *Rhododendron Nobleanum album* 'Gill's variety' (votes unanimous), from Messrs. Gill, Falmouth. This form of *R. Nobleanum* bears good trusses of wide-open white flowers tinged with pale green at the base and having the margins crinkled.

To *Saxifraga 'Riverslea'* (votes 8 for), from Messrs. Prichard, Christchurch. A small but very floriferous encrusted variety raised by the exhibitors as the result of a cross between *S. Godroneana* and *S. lilacina*. Its dark rosy-purple flowers are borne on stems about 1 $\frac{1}{2}$ inch high.

To *Viburnum fragrans candidissimum* (votes unanimous), from Sir William Lawrence, Bt., Dorking. This form differs from the type in having pure white flowers without any pink tint, and the leaves are not tinted with brown.

Other Exhibits.

Misses Hopkins, Shepperton : rock garden.
 Mr. Klinkert, Richmond : clipped Box-trees.
 Mr. G. A. Miller, Wisbech : *Primula* 'Clarkson Gem.'
 M. Nicholls, Esq., Sevenoaks : *Iris Edmanii*.
 Messrs. Sheppard, Birmingham : shrubs and alpine plants.

FLORAL COMMITTEE, MARCH 9, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and twenty other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Carter, Raynes Park, for Hyacinths.
 To Mr. J. W. Forsyth, Putteridge, for Cyclamen.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.
 To Mr. G. H. Dalrymple, Southampton, for Freesias.
 To Messrs. Engelmann, Saffron Walden, for Carnations.
 To Mr. E. J. Hicks, Hurst, for Roses.

Banksian Medal.

To Messrs. S. Low, Bush Hill Park, for Carnations and other greenhouse plants.

To Mr. G. A. Miller, Wisbech, for Primroses.
 To Mr. G. Prince, Oxford, for Roses.

Award of Merit.

To Carnation 'Rouge' (votes unanimous), from Messrs. Engelmann, Saffron Walden. A good light-red perpetual-flowering variety of excellent form. It lights up well under artificial light, and is highly recommended for market work.

To *Helleborus orientalis* 'Black Knight' (votes 11 for), from Messrs. Barr, Covent Garden. The flowers of this hardy herbaceous Lenten Rose are of a very dark purplish shade, almost black. They are borne on long stems and the whole plant is robust in habit.

To *Lachenalia* 'Monte Carlo' (votes unanimous), from Messrs. Carter Page, London. This variety was raised by the late Rev. J. Jacob, and the blooms exhibited on this occasion were grown by Messrs. Mauger of Guernsey. It produces good, bold spikes of deep golden-yellow flowers narrowly edged with red and having the upper segments tipped with green. The unopened buds are red and add beauty to the spike.

Cultural Commendation.

To Mrs. Harold Fergus, Exmouth, for Violet 'Princess of Wales,' A.M. 1895.

Other Exhibits.

Mr. J. J. Kettle, Corfe Mullen : Violets.
 Mr. B. Pinney, Shipbourne : Violets.
 Sir John Ramsden, Bt., Gerrards Cross : Carnation 'Mrs. Mary Taylor.'
 Messrs. Reamsbottom, West Drayton : Anemones.

Section B.

Mr. G. W. E. LODER, M.A., F.L.S., in the Chair, and twenty-four other members present.

Awards Recommended :—*Silver-gilt Banksian Medal.*

To Lady Loder, Horsham, for Rhododendrons.
 To Messrs. Russell, Richmond, for Azaleas.
 To Vice-Admiral A. W. Heneage Vivian, Swansea, for Rhododendrons.

Silver Banksian Medal.

To Messrs. Cutbush, Barnet, for rock garden.
 To Messrs. C. Elliott, Stevenage, for alpine plants.
 To Messrs. Gill, Falmouth, for Rhododendrons and Anemones.
 To Messrs. Prichard, Christchurch, for alpine plants.
 To Sir John Ramsden, Bt., Gerrards Cross, for Rhododendrons.
 To Mr. G. Reuthe, Keston, for shrubs and alpine plants.
 To Messrs. Waterer Sons & Crisp, Twyford, for shrubs and alpine plants.

Banksian Medal.

To Messrs. Baker, Wolverhampton, for shrubs and alpine plants.
 To Messrs. Barr, Covent Garden, for alpine plants.
 To Messrs. Cheal, Crawley, for alpine plants.
 To Messrs. Cuthbert, Southgate, for Azaleas.

To Misses Hopkins, Shepperton, for rock garden.
 To Messrs. Jeans & Trowbridge, West Moors, for alpine plants.
 To Messrs. Rogers, Southampton, for shrubs and alpine plants.
 To Messrs. Skelton & Kirby, Pirbright, for shrubs and alpine plants.
 To Messrs. Tucker, Oxford, for alpine plants.
 To Messrs. Wallace, Tunbridge Wells, for shrubs.
 To Mr. F. G. Wood, Ashted, for shrubs and alpine plants.

First-class Certificate.

To *Rhododendron sino-grande* (votes unanimous), from G. H. Johnstone, Esq., Probosc. This handsome Chinese species received an Award of Merit on May 9, 1922. On the present occasion a huge truss of large ivory-white campanulate flowers with a big crimson blotch at the base of each was exhibited, together with its accompanying very large dark-green glossy leaves, varying in length from 1 foot to 18 inches.

Award of Merit.

To *Azalea indica* 'Albert Elizabeth' (votes 8 for), from Messrs. Russell, Richmond. A very free-flowering variety with pretty double white flowers deeply edged with pink.

To *Clematis Armandii* 'Apple Blossom' (votes 13 for, 1 against), from Capt. B. Symons-Jeune, Old Windsor. This seedling was raised by the exhibitor, who claims that it is the latest flowering form of that beautiful climber *C. Armandii*. The flowers are borne with wonderful freedom in loose axillary clusters. Each bloom has five broad white sepals tinged with pink on the outside. The handsome ovate-lanceolate, prominently veined leaves are of a rich glossy green colour.

To *Primula Baileyana* (votes 6 for, 1 against), from Lady Aberconway and Hon. H. D. McLaren (gr. Mr. F. C. Puddle), Bodnant. A dainty little *Primula* discovered in Tibet by Mr. Kingdon Ward. Seed of it was sent home under No. 5985. The plant grows about 5 inches high and bears four or five lavender-blue flowers measuring about $\frac{1}{2}$ inch across. The calyces and the stems are very mealy. The small spatulate serrated leaves are borne on very thin 2-inch stalks.

To *Rhododendron Fargesii* (votes unanimous), from G. W. E. Loder, Esq., Ardingley. A native of Szechuan, China, discovered by Père Farges and introduced by Mr. E. H. Wilson. It bears loose trusses of about eight wide-open pale rose-pink flowers spotted inside with small dark-crimson dots. The small thin oval leaves are dark green above and paler below.

To *Rhododendron* 'His Majesty' (votes 12 for, 1 against), from Messrs. Gill, Falmouth. A pretty seedling bearing trusses of about a dozen very large wide-open campanulate cerise-pink flowers with a few dots of a deeper shade on the inside. The foliage is dark green and lanceolate.

To *Saxifraga* 'Arco Valleyi' (votes unanimous), from Messrs. C. Elliott, Stevenage. A small free-flowering encrusted variety raised by Sundermann. It has comparatively large pale-blush flowers on very short stalks.

To *Solandra grandiflora* (votes 8 for), from the University Botanic Garden, Cambridge. A very striking stove climbing shrub from Jamaica, bearing very large greenish-white trumpet-shaped scented flowers. The leaves are large and shiny.

To *Sycopsis sinensis* (votes unanimous), from Hon. Vicary Gibbs (gr. Mr. E. Beckett), Elstree. An evergreen bushy shrub introduced from Central China by Mr. E. H. Wilson. It has rather leathery ovate leaves. The flowers, which are borne in short, dense clusters, have no corolla, but depend for their beauty on the yellowish-brown stamens and the reddish-brown bracts enclosing the inflorescence.

Cultural Commendation.

To Capt. B. Symons-Jeune, Old Windsor, for *Clematis*.

Other Exhibits.

Mr. Gavin Jones, Letchworth : alpine plants.
 Mr. Klinkert, Richmond : clipped Box-trees.
 Messrs. Maxwell & Beale, Broadstone : alpine plants.
 Messrs. Robinson, New Eltham : alpine plants.
 Messrs. Scott, Alvechurch : *Ribes albidum nivum*.
 Messrs. Sheppard, Birmingham : shrubs and alpine plants.
 Swanley Horticultural College : Primulas.

FLORAL COMMITTEE, MARCH 23, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—*Gold Medal.*To Sir George Holford, K.C.V.O., Tetbury, for *Imantophyllums*.*Silver Banksian Medal.*

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Blackmore & Langdon, Bath, for *Polyanthus*.To Mr. G. H. Dalrymple, Bartley, for *Freesias*.To Mr. J. Douglas, Great Bookham, for *Auriculas*.

To Messrs. Englemann, Saffron Walden, for Carnations.

To Mr. J. W. Forsyth, Putteridge, for *Cyclamen*.To Mr. E. J. Hicks, Twyford, for *Roses*.

To Messrs. S. Low, Bush Hill Park, for Carnations and other greenhouse plants.

To Messrs. Sutton, Reading, for *Hyacinths*.*Banksian Medal.*To Messrs. Cuthbert, Southgate, for *Cinerarias*.To Sir Brodie Henderson, Hertford, for *Begonias*.To Mr. J. J. Kettle, Corfe Mullen, for *Violets*.To Mr. A. G. Miller, Wisbech, for *Primroses*.To Mr. G. Prince, Oxford, for *Roses*.*Award of Merit.*

To *Anemone* 'Creagh Castle' strain (votes 10 for, 4 against), from Mrs. Bucknall, Creagh Castle, Doneraile, Co. Cork. A good strain of 'St. Brigid' *Anemones*, including single and double flowers of large size and of various colours, ranging from white through purple and mauve shades to rose and scarlet.

To *Imantophyllum* 'Westonbirt Brilliant' (votes unanimous), from Sir George Holford, K.C.V.O., Tetbury. A variety of medium height bearing an immense head of bright orange-scarlet flowers which have pale-yellow markings at the base of the throat.

To *Primula malacoides* 'Dwarf Eclipse' (votes unanimous), from Messrs. Sutton, Reading. A remarkably free-flowering dwarf and compact form of *P. malacoides*. The flowers are large and deep rose-pink in colour, with a brownish-golden eye. They have crinkled margins and are borne in whorls on short, dense spikes. Some of the plants exhibited carried sixteen spikes of flowers.

Other Exhibits.J. C. Beck, Esq., Henley-on-Thames : *Carnation* 'Rose du Barri.'A. J. Crook, Esq., Winterbourne : *Viola* 'Ann Hathaway.'Messrs. Dobbie, Edinburgh : *Freesias*.Messrs. Luxford, Harlow : *Carnations*.Mr. B. Pinney, Shipbourne : *Violets*, *Primroses*, etc.*Section B.*

Mr. C. T. MUSGRAVE in the Chair, and twelve other members present.

Awards Recommended :—*Gold Medal.*

To M. Fenwick, Esq., Stow-on-the-Wold, for alpine plants in pans.

Silver Banksian Medal.

To Lady Aberconway and Hon. H. D. McLaren, Bodnant, for *Primulas*, *Rhododendrons*, and alpine plants.

To C. G. Kirch, Esq., Beckenham, for alpine plants in pans.

To Mr. G. Reuthe, Keston, for shrubs and alpine plants.

To Messrs. L. R. Russell, Richmond, for *Clematis*, etc.

Banksian Medal.

- To Messrs. Baker, Codsall, for shrubs and alpine plants.
- To Messrs. Cutbush, Barnet, for rock garden and shrubs.
- To Messrs. Maxwell & Beale, Broadstone, for alpine plants:
- To Messrs. Prichard, Christchurch, for shrubs and alpine plants.
- To Messrs. Rogers, Southampton, for shrubs and alpine plants.
- To Messrs. R. Veitch, Exeter, for shrubs.
- To Messrs. Waterer Sons & Crisp, Twyford, for shrubs and alpine plants.
- To Mr. F. G. Wood, Ashted, for alpine plants and shrubs.

First-class Certificate.

To *Rhododendron lacteum* (votes unanimous), from A. M. Williams, Esq., Launceston. This magnificent species is a native of W. China. The large sulphury-white campanulate flowers have a dark-crimson blotch at the base and dark-chocolate stamens. The fine, handsome truss bears twenty or more flowers. The leaves are dark green, and smooth above and covered with thick brown felt underneath.

Award of Merit.

To *Acacia Riceana* (votes 8 for), from Mrs. Charles Williams, Churston Ferrers. A very dainty species with long pendulous growths covered with very small pale sulphur-yellow flowers, which become golden-yellow with age. The narrow linear leaves are about 1 inch long.

To *Callistemon citrinus* var. *splendens* (votes unanimous), from the Royal Botanic Gardens, Kew. This Australian shrub has showy, brilliant red 'brushes' tipped with silvery-grey leaves. The most conspicuous parts of the flowers are the long red filaments.

To *Cypripedium ventricosum album* (votes 8 for), from M. Fenwick, Esq., Stow-on-the-Wold. This uncommon hardy orchid grows a little over a foot high, and has greenish-white flowers, with a large inflated labellum.

To *Prunus salicina* (votes 7 for), from Mr. R. C. Notcutt, Woodbridge. This *Prunus*, which is said to be synonymous with *P. triflora*, bears large numbers of small white flowers which are tinted with pink in the bud stage.

Botanical Certificate.

A recommendation for a Botanical Certificate to *Cupressus* × *Leylandii*, from C. J. Leyland, Esq., Beal, was passed to the Scientific Committee.

Other Exhibits.

- Cambridge Botanic Gardens : *Osmanthus Delavayi*.
- Donard Nursery Co., Newcastle : *Berberis undulata nana*.
- Messrs. C. Elliott, Stevenage : shrubs and alpine plants.
- Hon. Vicary Gibbs, Elstree : *Pyrus megalocarpa cuneata*.
- Messrs. Hodson, Nottingham : shrubs and alpine plants.
- Misses Hopkins, Shepperton : rock garden.
- Mr. G. Jones, Letchworth : alpine plants.
- Mr. Klinkert, Richmond : clipped trees.
- Messrs. Ladhams, Southampton : hardy plants.
- Lt.-Col. Messel, Handcross : *Primula pulchelloides*, *P. Cawdoriana*.
- Messrs. Skelton & Kirby, Pirbright : shrubs and alpine plants.
- Messrs. Tucker, Oxford : alpine plants.

FLORAL COMMITTEE, APRIL 7, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

- To Messrs. Allwood, Haywards Heath, for Carnations.
- To Messrs. B. R. Cant, Colchester, for Roses.

Silver Banksian Medal.

To Messrs. F. Cant, Colchester, for Roses.
 To Mr. G. H. Dalrymple, Bartley, for Freesias.
 To Messrs. Englemann, Saffron Walden, for Carnations.
 To Mr. E. J. Hicks, Twyford, for Roses.
 To Mr. G. Prince, Oxford, for Roses.

Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for Polyanthus.
 To Mr. J. Douglas, Great Bookham, for Auriculas.
 To Mr. G. A. Miller, Wisbech, for Polyanthus.
 To Mr. J. H. Pemberton, Havering-atte-Bower, for Roses.

Other Exhibits.

Mr. W. Bassett, Wisbech : Primula 'Madge.'
 Messrs. Crook, Beaconsfield : Polyanthus.
 Mr. J. J. Kettle, Corfe Mullen : Violets.
 Messrs. S. Low, Bush Hill Park : Carnations.

Section B.

Mr. G. W. E. LODER in the Chair, and fourteen other members present.

Awards Recommended:—*Silver-gilt Banksian Medal.*

To Col. Stephenson Clarke, C.B., Cuckfield, for Rhododendrons.

Silver Banksian Medal.

To Messrs. Cutbush, Barnet, for shrubs, rock garden, etc.
 To Messrs. C. Elliott, Stevenage, for shrubs and alpine plants.
 To Messrs. S. Low, Bush Hill Park, for Australian shrubs.
 To Messrs. Prichard, Christchurch, for shrubs and alpine plants.
 To Mr. G. Reuthe, Keston, for shrubs and alpine plants.
 To Messrs. Waterer Sons & Crisp, Twyford, for shrubs and alpine plants.

Banksian Medal.

To Messrs. Baker, Wolverhampton, for shrubs and alpine plants.
 To Messrs. Cuthbert, Southgate, for shrubs.
 To Mr. Hemsley, Crawley, for shrubs and alpine plants.
 To Messrs. Maxwell & Beale, Broadstone, for alpine plants.
 To Messrs. Rogers, Southampton, for shrubs and alpine plants.
 To Messrs. Russell, Richmond, for shrubs, Clematis, etc.
 To Mr. F. G. Wood, Ashted, for shrubs and alpine plants.

Award of Merit.

To *Acacia verticillata* (votes unanimous), from Messrs. S. Low, Bush Hill Park. A tender, free-flowering Australian shrub with small acicular leaves and little 'brushes' of pale sulphur-yellow flowers.

To *Drimys aromatica* (votes 10 for), from G. W. E. Loder, Esq., Ardingly. A tender, evergreen shrub from Chile, suitable for cultivation in the milder parts of England. It has dark-green lanceolate leaves, the leaf-stalks of which are suffused with red. The flowers have very narrow greenish-white petals and golden stamens.

To *Magnolia conspicua*, R. Veitch's variety (votes unanimous), from Col. Stephenson Clarke, Cuckfield. A very handsome form of *Magnolia conspicua*. The very large-cupped flowers are creamy-white and of good substance.

To *Meconopsis Baileyi* ? (votes unanimous), from Lady Aberconway and Hon. H. D. McLaren, Bodnant. This interesting hardy biennial was introduced from Tibet by Mr. Kingdon Ward under No. 5784. It has large pale-green sessile leaves, serrate and ciliate, clasping the stem. The flowers are pale blue, measure about 3 inches across, and have a mass of golden stamens.

To *Rhododendron adenopodum* (votes 7 for), from G. W. E. Loder, Esq., Ardingly. An interesting species from China bearing a truss of ten pale rose-pink campanulate flowers of medium size and rather deeper in colour outside than

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inside. There are a few crimson dots inside the flowers. The flower-stems are pink and the foliage is covered with pale-buff tomentum on the undersides.

To *Rhododendron Augustinii* (votes unanimous), from Dame Alice Godman, Horsham. The wide-open lilac-mauve flowers of this *Rhododendron* are borne in dense trusses of about twelve. There are a few greenish dots inside the flowers and the filaments are of a pinkish colour.

To *Templetonia retusa* (votes unanimous), from Lt.-Col. Messel, O.B.E., Handcross. An interesting and uncommon tender leguminous shrub suitable for cultivation in the cool greenhouse. It is erect in growth and bears mahogany-red flowers and very small, broadly ovate, dark green leaves.

Cultural Commendation.

To Lt.-Col. Messel, O.B.E. (gr. Mr. Comber), Handcross, for *Erinacea pungens*.

Other Exhibits.

G. P. Baker, Esq., Sevenoaks : *Fritillaria graeca*.

Misses Hopkins, Shepperton : rock garden.

Mr. Klinkert, Richmond : clipped Box-trees.

K. McDouall, Esq., Stranraer : *Rhododendron* hybrids.

W. Milner, Esq., Taplow : *Primula chionantha porphyrogenitos*.

Mr. B. Pinney, Shipbourne : *Viola septentrionalis*.

Messrs. Skelton & Kirby, Pirbright : shrubs and alpine plants.

Mrs. Lindsay Smith, Handcross : seedling *Cydonia*.

FLORAL COMMITTEE, APRIL 20, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Gold Medal.

To Sir George Holford, K.C.V.O., Tetbury, for Hippeastrums.

Silver-gilt Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Dobbie, Edinburgh, for *Schizanthus*.

To Messrs. S. Low, Bush Hill Park, for Carnations, etc.

Silver Banksian Medal.

To Mr. G. H. Dalrymple, Bartley, for Primulas.

To Messrs. Englemann, Saffron Walden, for Carnations.

Banksian Medal.

To Mr. G. A. Miller, Wisbech, for Polyanthus.

To E. M. Preston, Esq., Hayes, for Senecio 'Beauty of Cambridge.'

To Mr. J. H. Pemberton, Havering, for Roses.

To R. H. S. Gardens, Wisley, for Scented Pelargoniums.

Award of Merit.

To Cineraria 'Intermediate Pink' (votes 14 for, 3 against), from Messrs. Sutton, Reading. A very free-flowering and compact-growing pink variety.

To Hippeastrum 'Magic' (votes 14 for), from Sir George Holford, K.C.V.O., Tetbury. A very handsome intense deep-scarlet variety with a streak of white down the middle of the upper segment.

To Hippeastrum 'New Pink Pearl' (votes unanimous), from Lt.-Col. Sir George Holford, Tetbury. A beautiful deep cerise-pink variety having rounded segments with white blotches at the base.

To Hippeastrum 'The Bride' (votes 15 for), from Lt.-Col. Sir George Holford, Tetbury. An excellent large pure-white variety.

To Polyanthus 'Greenways Glory' (votes unanimous), from Miss C. Christy, Chelmsford. A good large Venetian-red variety with a paler orange eye. It was raised by Miss N. Benson of Penn, Bucks.

Other Exhibits.

Mrs. Bucknall, Doneraile : Anemones.
 Messrs. A. J. Crook, Winterbourne : Viola ' Ann Hathaway.'
 Messrs. J. & A. H. Crook, Beaconsfield : Polyanthus.
 E. A. Fenwick, Esq., Wolsingham : hybrid Primula.
 Messrs. Hodson, Nottingham : Auricula ' Joseph Bradbury.'
 Messrs. Jarman, Chard : Pelargoniums, Violas, etc.
 Maytham Gardens, Rolvenden : Spiraeas, etc.
 Messrs. Reamsbottom, West Drayton : Anemones.

Section B.

Mr. E. A. BOWLES, M.A., V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—*Gold Medal.*

To Hon. Vicary Gibbs, (gr. Mr. E. Beckett), Elstree, for rock garden.

Silver Banksian Medal.

To Messrs. Cheal, Crawley, for flowering shrubs.
 To Messrs. Hodson, Nottingham, for shrubs and alpine plants.
 To Mr. R. C. Notcutt, Woodbridge, for shrubs.
 To Messrs. Prichard, Christchurch, for alpine plants.
 To Messrs. Wallace, Tunbridge Wells, for flowering shrubs.

Banksian Medal.

To Messrs. Jeans & Trowbridge, West Moors, for alpine plants.
 To Messrs. Ladhams, Southampton, for shrubs and alpine plants.
 To Mr. G. Reuthe, Keston, for shrubs and alpine plants.
 To Messrs. Rogers, Southampton, for shrubs and alpine plants.
 To Messrs. Russell, Richmond, for Clematis, etc.
 To Messrs. Waterer Sons & Crisp, Twyford, for alpine plants.
 To Mr. F. G. Wood, Ashted, for alpine plants.

Award of Merit.

To *Anopterus glandulosa* (votes 12 for), from Lt.-Col. Messel, O.B.E., Handcross. A tender shrub introduced from Tasmania in 1823. It is of free-branching habit and bears erect terminal racemes of creamy-white bell-shaped flowers on reddish stems. The lanceolate leaves are bright-green and serrated.

To *Berberis kansuensis* (votes unanimous), from E. H. M. Cox, Esq., Glen-carne. A graceful and deciduous vigorous flowering shrub from Kansu, where it was found by the late Mr. R. Farrer. It bears numerous short racemes of pretty bright-yellow flowers and has broad oval leaves.

To *Bomarea × Banksii* (votes 9 for), from the Director, Botanic Garden, Cambridge. An interesting hybrid between *B. caldasiana* and *B. patacocensis*. The flowers are dull reddish-orange outside and gold spotted with brown inside.

To *Cistus × wintonensis* (votes unanimous), from Messrs. Hillier, Winchester. This delightful shrub was raised by the exhibitors in 1914, but its parentage is unknown. The possibility of its being a cross between a *Cistus* and a *Helianthemum* is suggested. It is of dwarf rambling habit, suitable for cultivation in the rock garden. Its flowers are white, about 2 inches across, and have a dark purplish-maroon zone around a golden eye.

To *Rhododendron 'Dame Nellie Melba'* (votes unanimous), from Lionel de Rothschild, Esq., Exbury. This variety was raised by Sir Edmund Loder as the result of a cross between *R. Standishii* and a blood-red form of *R. arboreum*. It produces loose trusses of very large, wide-open, bright-pink flowers with some crimson dots inside. The leaves are large, dark green, and glossy.

To *Rhododendron 'Lord Swaythling'* (votes unanimous), from Messrs. Wallace, Tunbridge Wells. A very free-flowering variety producing loose trusses of about nine deep blush-pink flowers, which are slightly paler inside and spotted with crimson.

Cultural Commendation.

To Sir Wm. Lawrence, Bt., Dorking, for *Iris Lortetii*, F.C.C. 1893.

Other Exhibits.

Mr. J. C. Allgrove, Slough : shrubs, etc.
 Messrs. Baker, Codsall : shrubs and alpine plants.
 Messrs. C. Elliott, Stevenage : alpine plants.
 Mr. Eschauzier, Wassenaar, Holland : alpine plants.
 Dame Alice Godman, Horsham : Rhododendrons.
 Misses Hopkins, Shepperton : rock garden.
 Mr. Klinkert, Rickmond : clipped trees.
 Messrs. Robinson, New Eltham : alpine plants.
 Messrs. Skelton & Kirby, Pirbright : shrubs and alpine plants.
 Miss A. S. Taylor, Reigate : Primula.
 Messrs. Tucker, Oxford : alpine plants.

FLORAL COMMITTEE, APRIL 27, 1926.

Section B.

AT THE RHODODENDRON SHOW.

Mr. G. W. E. LODER in the Chair, and eleven other members present.

Awards Recommended :—

First-class Certificate.

To *Rhododendron haematodes* (votes 9 for), from A. M. Williams, Esq., Launceston. This is one of the most striking Rhododendrons introduced from China by Mr. G. Forrest. It produces trusses of about a dozen bright-scarlet campanulate flowers. The small dark-green leaves are covered with brown tomentum underneath.

Award of Merit.

To *Rhododendron astrocalyx* (votes 9 for), from A. M. Williams, Esq., Launceston. Another beautiful Chinese species collected by Mr. G. Forrest. It bears trusses of about sixteen flattish clear lemon-yellow flowers, 2 inches in diameter. The flowers have chocolate stamens and are borne on pale-green stalks 2-3 inches long. The leaves are dark green above and silvery-grey beneath.

To *Rhododendron croceum* (votes 9 for), from A. M. Williams, Esq., Launceston. A pretty species collected by Mr. G. Forrest in Western China, where it makes a shrub 14-20 feet high. Each truss consists of about ten flattish bright-yellow flowers with pale-brown stamens. There is a touch of crimson on the interior of the flower. The small oblong leaves are dark green above and paler beneath.

To *Rhododendron 'Gladys'* (votes unanimous), from Rt. Hon. Lord Swaythling, Bitterne. A seedling raised by Col. Stephenson Clarke as the result of a cross between *R. campylocarpum* and *R. Fortunei*. It is of compact habit and perfectly hardy. The cream flowers are wide open and have wavy margins. There are some crimson markings on the upper segments. The unopened buds are of a delightful pink shade. Each truss carries six or seven blooms, and the plant is very free-flowering.

To *Rhododendron 'Mrs. A. M. Williams'* (votes 6 for, 2 against), from Messrs. Wallace, Tunbridge Wells. This variety was raised by the Dutch firm, Messrs. Van Nes. It produces medium-sized trusses of about nine wide-open flowers, which are deep red in bud, opening to a rich rose-pink.

To *Rhododendron 'Sir John Ramsden'* (votes 6 for, 1 against), from Messrs. Waterer Sons & Crisp, Bagshot. The parents of this variety are *R. 'Corona'* and *R. Thomsonii*. It is exceptionally free-flowering and produces medium-sized trusses of ten to a dozen wide-open flowers, which have a creamy-white ground-colour prominently streaked with rose-pink.

Other Exhibits.

R. Barclay, Esq., Falmouth : *Rhododendron 'Penjerrick,' A.M. 1923, R. 'Cornish Cross.'*

Mrs. Bolitho, Penzance : *Sciadopitys verticillata* in flower and fruit.

Col. Stephenson Clarke, C.B., Cuckfield : *Diervilla Middendorffiana, D. Maximowiczii.*

Mr. W. Cranage, Cranford : *Scilla nutans 'Cranfordia.'*

Messrs. Gill, Falmouth : *Rhododendron 'Pride of Kernick,' R. 'Gloriosa.'*

Messrs. van Nes, Boskoop : *Rhododendron 'W. R. Dykes.'*

FLORAL COMMITTEE, MAY 4, 1926.

Owing to the small attendance, occasioned by the general strike, Sections A and B of the Floral Committee amalgamated under the joint chairmanship of Mr. T. HAY and Mr. G. W. E. LODER. Fourteen other members were present.

*Section A.***Awards Recommended :—***Silver Banksian Medal.*

- To Messrs. Allwood, Haywards Heath, for Carnations.
- To Messrs. B. R. Cant, Colchester, for Roses.
- To Messrs. Englemann, Saffron Walden, for Carnations.

Banksian Medal.

- To Mr. J. Douglas, Great Bookham, for Auriculas.
- To Mr. E. J. Hicks, Twyford, for Roses.
- To Mr. H. J. Jones, Lewisham, for Hydrangeas.
- To Messrs. S. Low, Bush Hill Park, for Carnations.
- To Mr. G. A. Miller, Wisbech, for Trollius, etc.
- To Mr. J. H. Pemberton, Havering, for Roses.
- To Mr. G. Prince, Oxford, for Roses.
- To Messrs. Sutton, Reading, for Cinerarias.

Award of Merit.

To Auricula 'Queen Mary' (votes unanimous), from Mr. J. Douglas, Great Bookham. A very large deep velvety reddish-purple alpine Auricula with a prominent pale-yellow centre. The segments are less intense in colour towards the margins.

To Rose 'Lady Sylvia' (votes 9 for), from Mr. G. Prince, Oxford. A very beautiful H. T. variety raised by Mr. Walter Stevens. The form is excellent and the colour pink shaded with orange-salmon.

Other Exhibits.

- Messrs. Reamsbottom, West Drayton : Anemones.
- Mrs. Tennison, Westerham : Polyanthus.
- E. F. Wettern, Esq., S. Croydon : Cinerarias.

*Section B.***Awards Recommended :—***Silver-gilt Banksian Medal.*

- To Messrs. Endtz, Boskoop, for Azaleas.

Silver Banksian Medal.

- To Messrs. Cheal, Crawley, for shrubs and Dahlias.
- To Messrs. Ladhams, Southampton, for shrubs and alpine plants.
- To Messrs. Low, Bush Hill Park, for shrubs.
- To Mr. R. C. Notcutt, Woodbridge, for shrubs.
- To Messrs. L. R. Russell, Richmond, for Dracaenas.
- To Messrs. Waterer Sons & Crisp, Bagshot, for shrubs and alpine plants.
- To Mr. F. G. Wood, Ashted, for shrubs and alpine plants.

Banksian Medal.

- To Messrs. Baker, Codsall, for shrubs and alpine plants.
- To Maytham Gardens, Rolvenden, for shrubs.
- To Mr. G. Reuthe, Keston, for shrubs and alpine plants.
- To Messrs. Rogers, Southampton, for shrubs and alpine plants.
- To Messrs. Skelton & Kirby, Pirbright, for shrubs and alpine plants.
- To Mr. C. Turner, Slough, for Lilacs.

Award of Merit.

To *Berberis Vernae* (votes unanimous), from the Marquis of Headfort, Kells. A species introduced from W. Kansu by Mr. W. Purdom. It produces long

arching growths bearing pendulous racemes of small lemon-yellow flowers. The spines are strong, simple, and about 1 inch long. Its leaves are oblanceolate, pale green, and about 1 inch long.

To *Columnea microphylla* (votes 4 for, 1 against), from Sir William Lawrence, Bt., Dorking. A plant for the warm greenhouse from Costa Rica. Its growths are long and pendulous, and clothed with numerous small round cordate leaves, which are covered with purplish hairs. The flowers are bright orange-scarlet and very attractive.

To *Erica umbellata* (votes 6 for), from W. Van de Weyer, Esq., Dorchester. A pretty species from Portugal with very distinct, urn-shaped, rosy-mauve flowers. It grows about a foot high and is found on sandy hills and dry wastes.

To *Escallonia hybrida* 'C. F. Ball' (votes 6 for), from Mr. R. C. Notcutt, Woodbridge. A very large-flowered deep carmine-pink variety.

To *Rhododendron radicans* (votes unanimous), from J. B. Stevenson, Esq., Ascot. A matted prostrate species from the open alpine moors of S.E. Tibet, where it was found by Mr. G. Forrest, who sent home seed under No. F. 19919. It belongs to the Saluenense section, and bears numerous flattish rosy-purple flowers about 1 inch across, each on a reddish stalk. The small leaves are about $\frac{1}{2}$ inch long, dark green, and ciliate.

To *Viburnum utile* (votes unanimous), from the Marquis of Headfort, Kells. An evergreen shrub introduced from China by Mr. E. H. Wilson in 1901. It grows about 6 feet high, and its slender branches bear narrowly ovate dark glossy green leaves from 1 to 3 inches long. They are prominently veined and covered with dense white down underneath. The small white flowers are borne in densely packed terminal rounded trusses. The oval fruits are blue-black.

Selected for trial at Wisley.

Iris Reichenbachii, sent by Sir Wm. Lawrence, Bt., Dorking.

Other Exhibits.

M. Fenwick, Esq., Bourne: dwarf Chinese Pæony (Farrer 589).

Messrs. Reeves, Norwich: *Crataegus prostrata alba variegata*.

Messrs. Russell, Richmond: *Anthurium Scherzerianum bispathum*.

FLORAL COMMITTEE, MAY 25, 1926.

AT CHELSEA.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended:—

Award of Merit.

To Carnation 'Dorcas' (votes 18 for, 3 against), from Messrs. Engelmann, Saffron Walden. A dark-crimson perpetual-flowering variety of good form and possessing a very pronounced and pleasing scent.

To Carnation 'Hebe' (votes unanimous), from Messrs. Engelmann, Saffron Walden. A deep-pink fringed perpetual-flowering variety of good shape.

To Pelargonium 'Godfrey's Masterpiece' (votes 18 for), from Messrs. Godfrey, Exmouth. A very free-flowering, large, bright salmon-scarlet variety with very dark blotches on all the petals.

To Rose 'Cecil' (votes 6 for), from Messrs. B. R. Cant, Colchester. A large new seedling single deep lemon-yellow bedding Rose with a central mass of golden stamens.

To Rose 'Golden Salmon' (votes unanimous), from Messrs. Cutbush, Barnet. A dwarf perpetual-flowering polyantha Rose, from Holland, where it occurred as a sport from the variety 'Superba.'

To Rose 'Mrs. Beatty' (votes unanimous), from Messrs. B. R. Cant, Colchester. A large pale-yellow Rose of good form and possessing a pleasing scent. It is said to be a good grower.

Selected for Trial at Wisley.

Iris germanica 'Sybil,' from F. C. Stern, Esq., Goring-by-Sea.

Other Exhibits.

Mr. A. K. Bulley, Neston : Irises.
 Messrs. H. Chapman, Rye : *Iris Xiphium praecox alba*.
 Mr. G. R. Downer, Chichester : Lupines.
 C. Hanbury, Esq., M.P., Ventimiglia : *Gerbera Jamesonii hybrida*.
 Lady Charles Henry, Ascot : Carnation 'Lady Charles Henry.'
 Messrs. S. Low, Enfield : Carnation 'Mrs. Ives Improved.'
 Mr. H. Prius, Lisse : *Iris pallida* 'Queen of the Blue.'
 J. A. C. Roy, Esq., Cheadle : *Schizanthus retusus*.
 Messrs. Sutton, Reading : Gloxinia 'Sutton's Purple King.'
 Mrs. Tisdall, Woodford Green : Viola 'Violet Radiance.'

Section B.

Mr. C. T. MUSGRAVE in the Chair, and eighteen other members present.

Awards Recommended :—**First-class Certificate.**

To *Primula Florindae* (votes unanimous), from Messrs. Oliver & Hunter, Moniaive, Scotland. The 'Giant Cowslip Primula,' collected in Tibet by Capt. Kingdon Ward under No. K.W. 5781. It produces a bold stem about 2 feet high carrying a nodding mealy truss of thirty or more sulphur-yellow fragrant flowers. The leaves are large, serrated, and fleshy, and are borne on 3 to 4-inch long petioles. In its native habitat the plant attains a height of 3 to 4 feet, and is found in shady bogs where water is running.

Award of Merit.

To *Adiantum marginatum* (votes unanimous), from Mr. A. Perry, Enfield. A rather slender erect fern from California, with fronds a foot or more long, deltoid in general outline and tri- or quadri-pinnate.

To Azalea 'Knaphill Pink' (votes 8 for, 2 against), from Mr. Hosca Waterer, Woking. A pale rose-pink variety with an orange-yellow blotch on the upper segment. It resulted from a cross between *A. occidentalis* and *A. 'Bessie Holdaway'*.

To Azalea 'Knaphill White' (votes 11 for, 1 against), from Mr. Hosca Waterer, Woking. This variety is the result of a cross between *A. mollis* and *A. occidentalis*, and bears large trusses of white flowers marked with orange on the upper segment.

To Azalea 'Valencia' (votes 7 for), from Lionel de Rothschild, Esq., Exbury. A very striking vivid orange-scarlet variety of large size. It was raised by the late Mr. Anthony Waterer.

To *Bomarea acutifolia punctata* (votes 11 for), from Major A. A. Dorrien Smith, Tresco Abbey, Scilly. The flowers are borne in heads of twenty or more, and are bright reddish-orange outside, with an interior of golden-yellow spotted with crimson. The plant is a native of Guatemala and Peru.

To *Callicoma serratifolia* (votes 7 for, 2 against), from Major A. A. Dorrien Smith, Tresco Abbey, Scilly. A very handsome shrub from New South Wales and Queensland, bearing elegant ovate-lanceolate opposite leaves which are leathery, serrated, shining dark green above and covered with white tomentum beneath. The globular heads of cream-coloured flowers are very freely produced.

To *Campanula crenulata* (votes unanimous), from Mr. A. K. Bulley, Chester. This plant was discovered by Mr. G. Forrest. It has small, roundish, crenulate leaves and a flower-stem about 6 inches high, bearing deep violet-blue bells somewhat larger than those of our native *C. rotundifolia*.

To *Celmisia hieracifolia* (votes 9 for), from Lady Aberconway and the Hon. H. D. McLaren, Bodnant. A striking plant for the alpine-house. The leaves are long and narrow, with some sharp spines on the margins. They are white underneath. The flowers are large and are borne on stems 1 foot long. The ray florets are white and the disc golden-yellow.

To Iris 'Watbract' (votes 8 for, 2 against), from Mr. A. Perry, Enfield. As the name implies, this is the result of a cross between *I. Watsoniana* and *I. bracteata*. It is a charming small Iris with light-purple falls veined with violet and having a buff edging and a pretty blotch of cream, brown, and gold. The standards are lighter in colour than the falls.

To *Melaleuca lateritia* (votes unanimous), from Rev. A. T. Boscawen, Ludgvan. A West Australian flowering shrub which has proved hardy in Cornwall. It

has very small narrow leaves about 1 inch long and very handsome "brushes" of scarlet stamens.

To *Primula Cawdoriana* (votes unanimous), from Mr. A. K. Bulley, Chester. Another of Mr. Kingdon Ward's finds, sent home under No. K.W. 5741. It belongs to the Soldanelloides group, and has small, deeply serrated leaves with some white tomentum underneath. The flower-stem is about 1 foot high and bears a head of lavender flowers white at the top. The calyces and flower-stems are slightly mealy.

To *Primula flexilipes* (votes unanimous), from Mr. A. K. Bulley, Chester. A Chinese species with very distinct, crinkled, heart-shaped leaves on stalks 2 inches long. The heads of pale-yellow flowers are borne at the top of a stem 1 foot high.

To *Rhododendron 'Pilgrim'* (votes 12 for), from Lionel de Rothschild, Esq., Exbury. A seedling raised by Capt. J. Johnston as the result of a cross between *R. Fortunei* and *R. 'Gill's Triumph'*. It bears good trusses of about a dozen very large, wide-open, rich pink flowers with a few dark markings in the throat.

To *Roscoea Cautleoides Beesii* (votes 8 for, 3 against), from Mr. A. K. Bulley, Chester. A pale sulphur-yellow form of *R. Cautleoides*, which is a native of Western China, and a useful plant for the rock garden.

Other Exhibits.

C. Hanbury, Esq., La Mortola : *Melaleuca decussata*, *M. curvifolia*, *Ligustrum Iboia*, *Callistemon salignus*.

Messrs. Hillier, Winchester : *Rosa Willmottae* × *R. Moyesii*.

Mr. Gavin Jones, Letchworth : *Linaria melanantha*, *Oxalis chrysantha*.

Lady Loder, Horsham : *Rhododendron 'Leonardslee Giles'*.

C. J. Lucas, Horsham : *Sargentodoxa cuneata*.

C. T. Musgrave, Esq., Godalming : *Lathyrus pubescens*, A.M. 1903.

Mr. R. C. Notcutt, Woodbridge : *Azalea mollis* 'Mrs. J. Dykhuis,' *Berberis diaphana*, *Helianthemum 'Ben Mare'*.

R. H. S. Gardens, Wisley : *Salvia carduacea*.

Messrs. Russell, Richmond : *Araucaria elegans* var. 'Richmond Star.'

F. C. Stern, Esq., Goring-by-Sea : *Meconopsis Baileyi* var., *Primula microdonta alpicola*, *P. Waltonii*.

Messrs. Waterer Sons & Crisp, Bagshot : *Rhododendron 'Mother of Pearl'*.

FLORAL COMMITTEE, JUNE 15, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and twenty-one other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Dobbie, Edinburgh, for Sweet Peas.

Silver-gilt Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for Delphiniums.

To Mr. H. J. Jones, Lewisham, for Delphiniums.

To Orpington Nurseries, Ltd., Orpington, for Irises.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Bath, Wisbech, for Delphiniums and Pæonies.

To Messrs. Bunyard, Maidstone, for Irises, Pæonies, etc.

To Messrs. Kelway, Langport, for Pæonies and Delphiniums.

To Messrs. Wallace, Tunbridge Wells, for Irises.

To Messrs. Waterer Sons & Crisp, Twyford, for herbaceous plants.

Banksian Medal.

To Messrs. Barr, Taplow, for Irises, Pæonies, etc.

To Mr. T. Bones, Cheshunt, for Delphiniums.

To Mr. T. Carlile, Twyford, for Delphiniums.

To Messrs. Cheal, Crawley, for Dahlias.

To Mr. G. R. Downer, Chichester, for Lupines.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Messrs. S. Low, Bush Hill Park, for Carnations.
 To Mr. G. A. Miller, Wisbech, for herbaceous plants.
 To Mr. J. H. Pemberton, Havering, for Roses.

Award of Merit

To Delphinium 'Violet Robinson' (votes unanimous), from Messrs. Blackmore & Langdon, Bath. A magnificent variety having very large dark-blue flowers with white centres.

To Gypsophila 'Bristol Fairy' (votes unanimous), from Mr. W. Wells, jun., Merstham. This excellent herbaceous plant is an improvement on the old double-flowered *G. paniculata*. It is more robust and has a stronger constitution, and bears much larger panicles of pure-white double flowers. The height of the plant is about 4 feet, and flowering commences earlier than in the old form and continues over a long period. The plant is excellent for the border and for cutting, and when dried is very useful for winter decorations.

To Iris 'Frances' (votes 12 for, 1 against), from G. Yeld, Esq., Gerrards Cross. A pretty hardy border Iris of unknown parentage raised by the exhibitor. The standards are violet, while the falls are velvety-blue with gold streaks at the base.

To Pyrethrum 'Victoria' (votes unanimous), from Mr. H. Robinson, Hinckley. A useful double white variety of good size and form.

Other Exhibits.

Mr. W. Bassett, Wisbech: Heucheras.
 Mr. E. J. Coates, Shrivenham: Carnations.
 Messrs. C. Elliott, Stevenage: Viola 'Arkwright's Ruby.'
 Mr. J. Fulton, Harrow Weald: Carnations.
 Messrs. Godfrey, Exmouth: Pelargoniums.
 Lady Brodie Henderson, Hertford: Carnations.
 Messrs. Ladhams, Southampton: *Papaver orientale* 'Little Giant.'
 Mrs. Leach, Hillingdon: Delphinium 'Katharine.'
 Messrs. Maxwell & Beale, Broadstone: Gazania 'Vanity.'
 Mr. A. Perry, Enfield: Irises.
 H. W. Rawlinson, Esq., Rye: Carnation seedling.
 Sir J. Remnant, Bt., Twyford: Delphinium 'Miss M. Vennen.'

Section B.

Mr. G. W. E. LODER in the Chair, and twenty other members present.

Awards Recommended:—

Silver Lindley Medal.

To Sir Oscar Warburg, Epsom, for Cistuses.

Silver Banksian Medal.

To Messrs. Ladhams, Southampton, for herbaceous plants.
 To Mr. R. C. Notcutt, Woodbridge, for shrubs and herbaceous plants.
 To Mr. A. Perry, Enfield, for Irises, etc.
 To Mr. G. Reuthe, Keston, for shrubs and herbaceous plants.
 To Messrs. L. R. Russell, Richmond, for stove plants.
 To Capt. B. H. B. Symons-Jeune, Old Windsor, for Saxifraga 'Tumbling Waters.'
 To Messrs. Tucker, Oxford, for herbaceous and alpine plants.

Banksian Medal.

To Messrs. C. Elliott, Stevenage, for Lupines and alpine plants.
 To Messrs. Maxwell & Beale, Broadstone, for alpine plants.
 To Messrs. Prichard, Christchurch, for herbaceous plants.
 To Messrs. Rogers, Southampton, for shrubs, herbaceous and alpine plants.
 To Mr. W. Wells, jun., Merstham, for alpine plants.
 To Mr. F. G. Wood, Ashted, for alpine plants.

Award of Merit.

To *Allium Schubertii* (votes unanimous), from Mr. A. Perry, Enfield. An interesting species from Western Asia, with broad, long leaves and very large, handsome, many-flowered umbels of rose-red flowers.

To *Calceolaria* 'John Coutts' (votes 12 for, 2 against), from the Royal Botanic Gardens, Kew. A pretty greenhouse plant raised as the result of a cross between *C. integrifolia* ♀ and *C. cana* ♂. The plant inclines to the habit and general characteristics of the former, but is more sturdy, and the foliage shows the influence of *C. cana*. The flowers are larger and flatter than those of *C. integrifolia*. They are bright canary-yellow and sweetly scented.

To *Digitalis* 'Lütz' (votes 7 for, 2 against), from Sir William Lawrence, Bt., Dorking. An interesting hybrid between *D. purpurea* and *D. lutea*. The plant breeds true from seed and grows 10-12 feet high. The flowers are of a soft salmon-pink colour.

To *Phyteuma comosum* (votes unanimous), from Messrs. C. Elliott, Stevenage. A rare and interesting decumbent, unbranched, glabrous plant from the European Alps, bearing its flowers in a compact umbel. The leaves are deeply and coarsely toothed and the corollas of the flowers are about 1 inch long. The inflated portion is lilac, while the tubular part is dark purple.

To *Primula microdonta alpicola purpurea* (votes 9 for), from Lady Aberconway and Hon. H. D. McLaren, Bodnant. A beautiful *Primula* of the Sikkimensis group collected by Capt. Kingdon Ward in Tibet under number K.W. 5818. It has large, rich violet-purple pendulous flowers with a band of creamy-white meal round the inside of the cup. In its native habitat the plant grows 12-15 inches high and is found in open meadows and pastures within the forest belt where the ground is not boggy.

To *Rhododendron* 'Norman Shaw' (votes unanimous), from Lionel de Rothschild, Esq., Exbury. A large, handsome, rich pink-flowered *Rhododendron* resulting from a cross between *R. discolor* and *R. 'B. de Bruin'* made in 1919 by the exhibitor. The flowers are wide-open and have waved margins.

To *Saxifraga* 'Primulaize Salmon' (votes unanimous), from Messrs. Prichard, Christchurch. A densely tufted plant bearing short-stemmed heads of reddish flowers. It is the result of a cross between *S. primuloides* and *S. aizoides aurantiaca*.

Other Exhibits.

Messrs. Hopkins, Shepperton : alpines.

Mr. C. A. Jardine, Chiswick : *Geranium* sp.

Messrs. Wallace, Tunbridge Wells : *Vaccinium padifolium*, *Rhododendron* 'Lady Gwendoline Broderick.'

FLORAL COMMITTEE, JUNE 29, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Bees, Chester, for Delphiniums.

To Messrs. Blackmore & Langdon, Bath, for Delphiniums.

To Mr. H. J. Jones, Lewisham, for Delphiniums.

To Messrs. Russell, Richmond, for true ferns.

Silver Banksian Medal.

To Messrs. Barr, Taplow, for herbaceous plants.

To Mr. T. Bones, Cheshunt, for Delphiniums.

To Messrs. Chaplin, Waltham Cross, for Roses.

To Mr. G. R. Downer, Chichester, for Lupines.

To Messrs. Hewitt, Solihull, for Delphiniums.

To Messrs. Ladhams, Southampton, for herbaceous plants.

To Messrs. S. Low, Bush Hill Park, for Carnations.

To Messrs. Prichard, Christchurch, for herbaceous plants.

Banksian Medal.

To Messrs. Baker, Codsall, for herbaceous plants.

To Chalk Hill Nurseries, Reading, for herbaceous plants.

To Mr. T. Carlile, Twyford, for Delphiniums.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Mr. G. A. Miller, Wisbech, for herbaceous plants.
 To Mr. J. H. Pemberton, Havering, for Roses.
 To Messrs. Waterer Sons & Crisp, Twyford, for herbaceous plants.
 To Mr. F. G. Wood, Ashted, for herbaceous plants.

Award of Merit.

To Delphinium 'Lady Edith' (votes 12 for, 1 against), from Messrs. Blackmore & Langdon, Bath. An excellent variety producing bold spikes of mauve and blue semi-double flowers with a dark eye.

To Hydrangea 'Mrs. H. J. Jones' (votes unanimous), from Mr. H. J. Jones, Lewisham. A very pleasing pink variety of French origin.

To Wallflower 'Annual Double Strain' (votes unanimous), from Mr. E. Benary, Erfurt. A strain of new annual double Wallflower of Stock-like habit. The flowers vary in colour from deep golden-yellow to brown. The plants exhibited were raised from seed sown on February 1, and by sowing in succession plants may be had in bloom all the year round.

Other Exhibits.

H. A. Astbury, Esq., Beckenham : Delphinium 'Gwen Astbury.'

Mr. W. Bassett, Wisbech : Chrysanthemum 'Dr. Miles,' Heuchera 'Salmon Queen.'

Mr. G. Carpenter, Byfleet : Carnations.

Major G. Churcher, Lindfield : Gladiolus 'Golden Swallow.'

Dr. Croly, Burnham : Viola 'Hazelhurst Mauve.'

Messrs. A. J. Crook, Winterbourne : Border Carnations.

Messrs. Maxwell & Beale, Broadstone : Erigeron 'Mrs. F. H. Beale.'

A. J. Morten, Hartpury : seedling Roses.

Messrs. Carter Page, London : Petunia 'Silver Queen.'

Messrs. Prior, Colchester : Rose 'Jack Hobbs.'

Mr. E. P. Smith, Edmonton : Lobelia 'Mrs. Andrews.'

W. Van de Weyer, Esq., Dorchester : hybrid Thrifts.

Mr. C. G. van Tubergen, jun., Haarlem : Ismene 'Sulphur Giant.'

Mr. Wells, jun., Mersham : herbaceous plants.

Section B.

Mr. G. W. E. LODER in the Chair, and fifteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Mr. A. Perry, Enfield, for herbaceous, bog and water plants.

Banksian Medal.

To Messrs. Hollamby, Groombridge, for shrubs.

To Mr. Gavin Jones, Letchworth, for alpiners.

To Messrs. Maxwell & Beale, Broadstone, for alpiners.

Award of Merit.

To *Arctotis breviscapa* (votes unanimous), from Mr. T. Hay, Hyde Park, London. A South African plant belonging to the Compositae. The large flowers are borne on rounded stems covered with purplish hairs. The ray florets are deep golden-orange on the inner side with a black-purple spot at the base. On the outer side they are streaked with purplish-red. The disc is black-purple. Some of the leaves are entire, others are lyrate, pinnatifid, and crenate.

To *Ononis fruticosa* (votes unanimous), from the University Botanic Garden, Cambridge. A charming sturdy compact shrub for the rock garden. It is a native of Southern Europe and bears clusters of pale-rose flowers, the wings of which are lighter than the keel. The leaves are small, narrow, dark green and serrated.

To *Pontederia crassipes lanceolata* (votes unanimous), from Mr. A. Perry, Enfield. A South American water or bog plant with pretty pale-blue flowers borne in a large lax spike. The upper segment of each flower is marked with a green blotch. The lanceolate leaves are carried on long stalks.

To *Rhododendron diaprepes* (votes unanimous), from Lionel de Rothschild, Esq., Exbury. A very striking Chinese species bearing large white trumpet-shaped flowers tinged with pink on the outside.

lx PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Cultural Commendation.

To Mr. Gavin Jones, Letchworth, for *Campanula cenisia*.

Other Exhibits.

Messrs. Bees, Chester : *Lilium Roemerii*.

Hon. Vicary Gibbs, Elstree : *Pinus sylvestris alba*.

Misses Hopkins, Shepperton : rock garden.

Mrs. Walter Jones, Comrie : white seedling *Meconopsis Wallichii*, *Meconopsis Florindae*.

Sir Wm. Lawrence, Bt., Dorking : *Cooperanthes* × *alipurensis* (recommended for Botanical Certificate), Philadelphus 'Atlas.'

Messrs. Prichard, Christchurch : *Poterium tenuifolium album*.

Messrs. Robinson, New Eltham : rock garden.

Mr. Slocock, Old Woking : Rhododendrons.

Messrs. Tucker, Oxford : alpine plants.

W. Van de Weyer, Esq., Dorchester : *Orobanche crenata* (recommended for Botanical Certificate), *Coris monspeliensis*.

ORCHID COMMITTEE.

JANUARY 12, 1926.

C. J. LUCAS, Esq., in the Chair, and sixteen other members present.

Awards Recommended :—

Gold Medal and Congratulations of the Council.

To G. F. Moore, Esq., V.M.H., Chardwar, Bourton-on-the-Water, Glos, for a superb group of 200 *Cypripediums*, all but six of which had been raised in the exhibitor's own garden.

Gold Medal.

To Robert Paterson, Esq., Stamperland House, Cathcart, Glasgow, for *Cypripediums* and other Orchids.

Silver-gilt Banksian Medal.

To H. T. Pitt, Esq., Rosslyn, Stamford Hill, for rare species and hybrids.

Silver Banksian Medal.

To Messrs. Cowan & Co., Southgate, N., for various hybrids.

To Messrs. Charlesworth & Co., Haywards Heath, for hybrids.

To Messrs. Cypher & Sons, Cheltenham, for *Cypripedium* hybrids.

To Messrs. Armstrong & Brown, Tunbridge Wells, for *Cypripediums* and other Orchids.

To Messrs. Stuart Low & Co., Jarvisbrook, Sussex, for species and hybrids.

To Messrs. J. & A. McBean, Cooksbridge, Sussex, for *Odontoglossums* and *Cypripediums*.

Bronze Banksian Medal.

To Messrs. Black & Flory, Slough, for *Cypripediums* and *Cattleyas*.

First-class Certificate.

To *Cypripedium* × 'Marmion,' Holford's var. ('Germaine Opoix' × 'Jura') (votes unanimous), from Lieut.-Col. Sir George Holford, K.C.V.O., Westonbirt, Tetbury, Glos. A large flower with the dorsal sepal almost covered with crimson, the upper portion white, the broad petals yellowish, suffused with mahogany-red, and the labellum large and similarly coloured.

To *Cypripedium* × 'Christmas Cheer,' of unrecorded parentage (votes 9 for, 2 against), from Robert Paterson, Esq. The dorsal sepal is suffused with dark purple, bordered with white; the petals undulated at the margin, mahogany-red, with darker veining, and bordered with yellow; labellum reddish.

To *Brassocattleya* × 'Mrs. Robert Paterson' (*C.* × 'Clotho' × *B.-c.* × *Cliftonii*) (votes unanimous), from Messrs. Black & Flory, Slough. A flower of excellent form. The broad petals meet one another in front of the dorsal sepal. Bright mauve-pink, the labellum with a crimson front lobe and yellowish throat.

Award of Merit.

To *Cypripedium* × 'Baldur,' Holford's var. ('G. F. Moore' × 'Niobe') (votes unanimous), from Lieut.-Col. Sir George Holford. Much resembling the well-known 'Niobe' type of flower. The dorsal sepal stained and marked with rose-crimson, the petals mahogany-red.

To *Cypripedium* × 'Saladin' (*Chapmanii* × 'Olenus') (votes 9 for, 4 against), from Robert Paterson, Esq. Petals developed to an unusual extent (due to the influence of *C. bellatulum* contained in both parents) and marked with minute spots of red; dorsal sepal comparatively small, greenish, with purple lines.

To *Cymbidium* × 'Erin,' Gatton Park var. (*grandiflorum* × *gattonense*) (votes unanimous), from Sir Jeremiah Colman, Bt., Gatton Park, Surrey. The spike bore eight large flowers of a pleasing green colour in the sepals and petals; the labellum yellowish, with bright-red spotting and a median line of red. The flowers are very fragrant.

To *Cypripedium* × 'St. Kentigern' ('Albert Fisher' × 'Perseus') (votes 9 for), from R. Paterson, Esq. The dorsal sepal intense crimson, the petals mahogany-red, the labellum reddish, with a yellow marginal line.

To *Miltonia* × 'Princess Mary' (*Hyeana* × *Bleuana*) (votes unanimous), from R. Paterson, Esq. A pretty variety. The spike bore five flowers of a uniform rose-colour, the labellum having a mask of slightly deeper colour at its base.

Preliminary Recognition.

To *Millonia* × 'Lucia,' Stamperland var., from R. Paterson, Esq. This immature seedling carried a single flower, in which the petals were flushed at the base with crimson, and the labellum had the central area suffused with purple.

Cultural Commendation.

To Mr. F. W. Thurgood, orchid-grower to H. T. Pitt, Esq., Rosslyn, Stamford Hill, for a superb example of *Eulophiella* × *Rolfei*, with three many-flowered spikes.

Other Exhibits.

Messrs. A. J. Keeling & Sons, Westgate Hill, Bradford: *Monomeria barbata* and the scarce *Odontoglossum Oerstedii album*.

Sir Jeremiah Colman, Bt.: *Coelogyne Mooreana*, with four erect spikes of white flowers; *Lycaste* × 'Beryl,' with rose-coloured flowers, the scarce *Pleurothallis scapha* and three specimens of *Cymbidium* × 'Queen of Gattin.'

Lieut.-Col. Sir George Holford: *Cypripedium* × 'Reindeer' ('Viking' × 'Golden Eagle'), and *Cypripedium* × 'Swallow.'

Mrs. Beatrice Jervoise, Herriard Park: *Odontoglossum crispum herriardense*, with numerous flowers, blotched with purple.

Robert Gerrish, Esq., Milford Manor, Salisbury: *Odontoglossum* × 'Vida,' with four flowers having the segments marked with reddish blotching.

F. J. Hanbury, Esq., Brockhurst, East Grinstead: *Cypripedium* × 'Jungfrau,' a large flower in which the white dorsal sepal has a yellow base, the petals and labellum being brownish-yellow.

ORCHID COMMITTEE, JANUARY 26, 1926.

C. J. LUCAS, Esq., in the Chair, and fourteen other members present.

Awards Recommended:—

Silver-gilt Banksian Medal.

To Messrs. Charlesworth & Co., Haywards Heath, for hybrids.

Silver Banksian Medal.

To Messrs. Sanders, St. Albans, for species and hybrids.

To Messrs. Stuart Low & Co., Jarvisbrook, Sussex, for species and hybrids.

To Messrs. Cowan & Co., Southgate, for *Cypripediums*.

To Messrs. J. & A. McBean, Cooksbridge, Sussex, for various orchids.

Bronze Banksian Medal.

To Messrs. Armstrong & Brown, Tunbridge Wells, for *Cypripediums*.

Silver Lindley Medal.

To G. F. Moore, Esq., V.M.H., Bourton-on-the-Water, for *Cypripedium* × 'Sir Trevor.'

First-class Certificate.

To *Cypripedium* × 'Sir Trevor' ('Casella' × 'Christopher') (votes unanimous), from Geo. F. Moore, Esq., V.M.H. A beautiful and very distinct *Cypripedium* of large size, the dorsal sepal porcelain-white on the upper two-thirds of its area, the base light greenish; the petals broad, and light yellowish-green; the labellum yellowish. A special feature is the entire absence of any spotting or colour markings.

To *Odontioda* × 'Colinge' var. 'Rosemary' (votes unanimous), from J. J. Bolton, Esq., Claygate, Surrey. This plant bore a spike of fourteen flowers of

almost solid crimson-red colour, the margin being rose-tinted; the labellum white, with a red blotch near the yellow crest.

To *Miltonia* × '*Lycaena*' (votes unanimous), from Messrs. Charlesworth, Haywards Heath. A hybrid with flowers of unusual size, the petals flushed with crimson on their basal half, the labellum stained with purple on the central area.

To *Odontioda* × '*Gwendoline*' var. '*Stamperland*' (votes 7 for, 1 against), from Robt. Paterson, Esq., Cathcart, Glasgow. The chief feature of this hybrid lies in the blood-red colour of the flowers, which is evenly suffused, except for a very narrow marginal line of rose; the lip is whitish, with blotching of deep red.

Award of Merit.

To *Cypripedium* × '*Peerless*' (*Curtisii* *Sanderæ* × *Holdenii*) (votes unanimous), from Messrs. Armstrong & Brown, Tunbridge Wells. This flower has much of the character of the former parent; it is light yellowish-green with emerald-green venation.

To *Sophrolaeliocattleya* × '*Vulcan*' var. '*Picotee*' (votes unanimous), from Messrs. Black & Flory, Slough. A hybrid of rich coloration, bright purple in the sepals and petals, the labellum much more intense and with an additional crimson tinge.

Cultural Commendation.

To Messrs. Charlesworth for *Odontoglossum* × '*Dora*,' which produced a spike of 104 flowers, fifteen of which, unfortunately, had been broken off.

To Mr. H. W. Redden, orchid-grower to Geo. Wm. Bird, Esq., The Manor House, West Wickham, Kent, for *Laeliocattleya* × '*Pioneer*,' a well-cultivated plant bearing ten flowers of bright-purplish colour.

Botanical Certificate.

To *Bulbophyllum penicillium*, from J. J. Joicey, Esq., The Hill, Witley, Surrey. A remarkable species from Further India. The rachis bore numerous uniform brown flowers, the labellum being motile and responding to the slightest movement of the air.

Preliminary Recognition.

To *Odontoglossum* × *regium* var. '*Britannia*,' from Messrs. Charlesworth, Haywards Heath. An immature seedling with a single flower, the segments broadly developed, and heavily marked with purplish crimson.

Other Exhibits.

Mr. Harry Dixon, Wandsworth Common: *Cypripedium* × *Rossettii*, and other members of the genus.

Messrs. Black & Flory, Slough: *Cypripedium* hybrids, including the Langley variety of '*Golden Wren*.'

Messrs. A. J. Keeling: *Cypripedium* × '*Sunrise*' and the F.C.C. variety of *Cypripedium* × '*Perseus*.'

Baron Bruno Schröder, Englefield Green: *Cattleya* × '*Minnehaha*,' of fine form and pure white.

G. F. Moore, Esq.: *Cypripedium* × '*Memoria* H. J. Elwes,' in which the dorsal sepal is boldly marked with crimson-purple spotting.

J. J. Bolton, Esq.: *Cypripedium* × '*Phipp*,' with porcelain-white flowers, and a fine variety of *C.* × '*Charmion*.'

ORCHID COMMITTEE, FEBRUARY 9, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and sixteen other members present.

Awards Recommended:—

Silver-gilt Banksian Medal.

To Messrs. Charlesworth, Haywards Heath, for species and hybrids.

To Messrs. J. & A. McBean, Cooksbridge, Sussex, for various hybrids.

Silver Banksian Medal.

To H. T. Pitt, Esq., Rosslyn, Stamford Hill, for rare species and hybrids.
 To Messrs. J. Cypher & Sons, Cheltenham, for *Cypripediums*.
 To Messrs. Stuart Low & Co., Jarvisbrook, Sussex, for species and hybrids.
 To Messrs. Cowan & Co., Southgate, for *Cattleyas*.
 To Messrs. Sanders, St. Albans, for *Cypripediums* and *Brassavola* hybrids.
 To Messrs. Sutton Bros., Hassocks, for various species and hybrids.

Award of Merit.

To *Cattleya* × 'Minnehaha' (*Trianae* × 'Lady Rowena') (votes unanimous), from Baron Bruno Schröder, Englefield Green, Surrey. The large flower has broadly formed segments which are snow-white, except for some yellow in the throat of the labellum.

To *Cymbidium* × 'Flamingo' var. 'White Wings' (*Alexanderi* × 'Merlin') (votes unanimous), from Lieut.-Col. Sir Geo. Holford, K.C.V.O., Westonbirt, Tetbury, Glos. The arching spike bore six large flowers, ivory-white, with light crimson markings on the lip.

To *Cymbidium* × 'Miranda' var. 'Lemon Queen' (votes unanimous), from Sir Geo. Holford, K.C.V.O. A pleasing hybrid with a spike of fourteen large flowers of clear lemon-yellow, the labellum whitish, with a few reddish spots on the lip.

To *Brassocattleya* × 'Warnham Beauty' (*B.-c.* × *Digbyano-Mossiae* × *C.* × 'Tityus') (votes unanimous), from C. J. Lucas, Esq., Warnham Court, Horsham. The two large flowers were of a richer colour than usually seen in *Brassavola* hybrids, the sepals and petals rosy-mauve, the round labellum rich purple, with the margin crisped.

To *Odontoglossum* × 'Gatton Prince' ('Gatton Princess' × 'Gatton Emperor' (votes 8 for), from Sir Jeremiah Colman, Bt., Gatton Park, Surrey. A promising hybrid, not fully developed. The spike bore three flowers having the segments of rich crimson-red colour.

Odontoglossum × 'Alvara' ('Ithone' × 'Clovis') (votes 6 for, 2 against), from Messrs. Charlesworth, Haywards Heath. Flowers much above the average size, deep crimson, the sepals and petals margined with white, the labellum having a broader zone of white.

To *Odontonia* × 'Nesta' (*Odontonia* × 'Gladys' × *Odm.* × 'St. George') (votes unanimous), from Messrs. Charlesworth. A young seedling with a couple of large flowers, rose-tinted and heavily blotched with dark crimson.

Cultural Commendation.

To Mr. J. Collier, orchid-grower to Sir Jeremiah Colman, Bt., Gatton Park, Surrey, for a superb specimen of *Brassocattleya* × 'Gatton Lily' var. *magnifica*, with nine large white flowers, the labellum fringed and with a purple-coloured front lobe.

Other Exhibits.

Messrs. A. J. Keeling & Sons, Westgate Hill, Bradford: *Cymbidium* × 'White Wings,' various *Cypripediums*, and *Odontoglossum* × *citrinum*, with yellow spotting.

J. J. Bolton, Esq., Claygate, Surrey: *Odontoglossum* × 'Exworth' var. 'Duke of York,' with a spike of thirteen flowers, and *Odontoglossum* × 'Garnet' with a spike of eleven flowers.

Sir Jeremiah Colman, Bt.: *Brassocattleya* × 'Gatton Lily' var. *majestica*, and *Brassocattleya* × 'Gatton Princess,' with three large flowers of pinkish colour.

Lieut.-Col. Sir George Holford: *Cymbidium* × 'Guillemot,' greenish, with crimson shading; *Cymbidium* × 'Goosander' var. 'Pinkie,' and *Cymbidium* × 'Plover,' with a spike of thirteen greenish flowers.

Messrs. Black & Flory, Slough: *Cattleya* × 'Mrs. Robert Paterson' var. 'Gargantua,' and several *Cypripediums*.

E. Berkeley Ormerod, Esq., Henley-on-Thames: *Odontoglossum* × 'Dodeham' var. 'Mimosa.'

F. J. Hanbury, Esq., Brockhurst, East Grinstead: *Odontonia* × 'Olivia,' Brockhurst var., with flowers of large size and exhibiting much yellow colour.

Mr. Harry Dixon, Wandsworth Common: *Cymbidium* × *Cravenianum*.

ORCHID COMMITTEE, FEBRUARY 23, 1926.

C. J. LUCAS, Esq., in the Chair, and fourteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Sanders, St. Albans, for group of *Cymbidium* hybrids.

To Messrs. Charlesworth, Haywards Heath, for various Orchids.

Silver Banksian Medal.

To Messrs. Cowan & Co., Southgate, for choice Cattleyas.

To Messrs. Stuart Low & Co., Jarvisbrook, Sussex, for species and hybrids.

To Messrs. Black & Flory, Slough, for *Cypripediums*.

To Mr. Harry Dixon, Wandsworth Common, for *Dendrobiums* and other Orchids.

First-class Certificate.

To *Miltonia* × 'Lycaena,' Stamperland var. (votes unanimous), from Robert Paterson, Esq., Cathcart, Glasgow. The spike bore three large flowers, the petals rich crimson, except for a narrow marginal zone, the widely formed labellum of similar colour, the base having a brownish mask, with radiating lines on a lighter ground.

Award of Merit.

To *Cymbidium* × 'Fleming' var. *rotundiflorum* (votes unanimous), from Lieut.-Col. Sir George Holford, K.C.V.O., Westonbirt, Tetbury, Glos. Flowers compactly formed, of bluish tint, the labellum with a crimson blotch on the front lobe and some rose markings on the lateral lobes; column rose-coloured.

To *Vuystekeara* × 'Melba' (*Vuystekeara* × *Brewit* × *Odm.* × 'Gorizia') (votes unanimous), from Messrs. Charlesworth, Haywards Heath. Flowers of the *Miltonia vexillaria* habit, of crimson-purple colour on the sepals and petals, bright purple on the labellum; spiny crest yellow.

To *Odontoglossum* × *citrinum* var. 'Prince of Orange' (votes 9 for, 1 against), from Messrs. Charlesworth. An interesting hybrid between *O. eximium xanthotes* and *O. 'Boadicea' aureum*. The spike bore ten flowers of saffron-yellow colour, with blotching of deep yellow.

To *Brassolaeliocattleya* × 'Nigeria' (*B.-l.-c.* × *pulcherrima* × *C. Warscewiczii*) (votes 9 for, 4 against), from Messrs. Charlesworth. Colour much deeper than usually seen in *Brassavola* hybrids, being deep rose on the sepals and petals, the labellum having a purple zone on the frontal area.

Other Exhibits.

E. R. Ashton, Esq., Camden Park, Tunbridge Wells: *Odontoglossum* × 'St. George,' with a spike of fourteen flowers, heavily blotched.

Geo. Wm. Bird, Esq., Manor House, West Wickham, Kent: *Odontioda* × 'Glady's' var. *magnifica*, flowers prettily tinged with rose-violet and spotted with red.

G. F. Moore, Esq., V.M.H., Chardwar, Bourton-on-the-Water, Glos: several handsome *Cypripedium* hybrids.

Messrs. Armstrong & Brown, Tunbridge Wells: *Cypripedium* × 'Memoria F. M. Ogilvie' var. 'The King,' which had been in flower six weeks.

ORCHID COMMITTEE, MARCH 9, 1926.

C. J. LUCAS, Esq., in the Chair, and nineteen other members present.

Awards Recommended :—

Gold Medal.

To Messrs. McBean, Cooksbridge, Sussex, for a superb group.

Silver-gilt Banksian Medal.

To Messrs. Sanders, St. Albans, for *Cymbidiums* and other Orchids.

To J. J. Joicey, Esq., The Hill, Witley, Surrey, for species and hybrids.

To Messrs. Charlesworth & Co., Haywards Heath, for meritorious hybrids.

To Messrs. Cowan & Co., Southgate, for *Cymbidiums*.

LXVI PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Silver Banksian Medal.

To Messrs. Stuart Low & Co., Jarvisbrook, Sussex, for species and hybrids.
To Messrs. Sutton Bros., Hassocks, Sussex, for various Orchids.

Bronze Banksian Medal.

To Mr. Harry Dixon, Wandsworth Common, for species and hybrids.

Silver-gilt Lindley Medal.

To *Cymbidium* × *Alexanderi*, Westonbirt var., from Lieut.-Col. Sir George Holford, K.C.V.O., Westonbirt, Tetbury, Glos. A F.C.C. was awarded to this plant on March 14, 1922. On the present occasion it bore three spikes with an aggregate of twenty-three large flowers, porcelain-white, the sepals and petals having a few spots on their basal area, the labellum marked with rose tracery, and the column rose-pink.

First-class Certificate.

To *Odontioda* × *Joiceyi* var. 'John Cowan' (votes 15 for, 2 against), from J. J. Bolton, Esq., Claygate, Surrey. An Award of Merit was given to this plant on April 29, 1924. The spike now carried nine large flowers, the sepals and petals crimson-red, the labellum whitish, with a crimson blotch adjoining the yellow crest.

Award of Merit.

To *Cattleya* × 'Linda' (*Cowaniae* × 'Lady Veitch') (votes unanimous), from Messrs. Cowan. Of model form, pure-white, margin of petals and lip frilled.

To *Cymbidium* × *Louisiae* var. *splendens* (*Pauwelsii* × *Andreanum*) (votes unanimous), from Messrs. Cowan. The spike bore twenty-one large terra-cotta flowers with the lips marked with red.

To *Sophrolaeliocattleya* × 'Edna' var. 'Mrs. Hanmer' (*S.-l.-c.* × 'Marathon' × *C.* × *Hardyana*) (votes unanimous), from Messrs. McBean. Flowers of bright rose-purple with a crimson overtint and venation of a darker colour, the labellum purplish-crimson.

To *Cymbidium* × 'Wheatear' Westonbirt var. (votes 9 for, 3 against), from Lieut.-Col. Sir George Holford, K.C.V.O., Westonbirt, Tetbury, Glos. Flowers large, yellowish, with a bronze over-tint, the lip having a conspicuous crimson band on the front lobe.

To *Cymbidium* × 'Toucan' (votes unanimous), from Lieut.-Col. Sir George Holford, K.C.V.O. Of unrecorded parentage. The spike bore fifteen flowers of a peculiar reddish-bronze colour, the whitish labellum with a crimson zone around the front lobe.

To *Cymbidium* × 'Castor,' Joicey's var. (votes unanimous), from J. J. Joicey, Esq., The Hill, Witley, Surrey. A strong plant with a spike of thirteen large flowers, white, the labellum with a pair of yellow keels, and with rose markings on the front lobe.

Other Exhibits.

Messrs. Black & Flory, Slough: *Brassocattleya* × 'Mrs. Robert Paterson,' various other Cattleyas, and a fine form of *Cypripedium* × 'The Provost.'

Lieut.-Col. Sir George Holford: distinct *Cymbidium* hybrids.

F. J. Hanbury, Esq.: *Odontoglossum* × 'Porteus,' with large purple flowers.

J. J. Bolton, Esq.: *Odontoglossum* × *ardentissimum* var. *Robsonae*.

H. T. Pitt, Esq., Stamford Hill: *Miltonia* × 'William Pitt,' with crimson-purple flowers.

ORCHID COMMITTEE, MARCH 23, 1926.

Lieut.-Col. Sir GEORGE HOLFORD, K.C.V.O., in the Chair, and fifteen other members present.

Awards Recommended:—

Silver Banksian Medal.

To H. T. Pitt, Esq., Stamford Hill, for species and hybrids.

To Messrs. Sanders, St. Albans, for *Cymbidiums* and *Cattleyas*.

To Messrs. Cowan, Southgate, for *Cymbidium* hybrids.

To Messrs. Stuart Low, Jarvisbrook, Sussex, for species and hybrids.

Bronze Banksian Medal.

To Mr. Harry Dixon, Wandsworth Common, for a group.

First-class Certificate.

To *Cymbidium* × 'Petrel,' Westonbirt var. (*Pauwelsii* × 'Garnet') (votes unanimous), from Lt.-Col. Sir George Holford, K.C.V.O. Sepals and petals of varying rose-pink tints, the labellum having the front lobe of rich crimson, the same colour extending by broad lines on each of the lateral lobes. In no other *Cymbidium* has so much colour been seen on the labellum.

To *Cattleya* × 'Minnehaha,' The Dell Park var. (*Trianae* × 'Lady Rowena') (votes unanimous), from Baron Bruno Schröder, Englefield Green, Surrey. The petals are unusually broad, and the whole flower is pure white, except for some orange-yellow in the tube of the labellum.

Award of Merit.

To *Laeliocattleya* × 'Saffron' var. 'Rajah' (*L.-c.* × 'Smilax' × *L.-c.* × 'Cupid') (votes unanimous), from Col. Stephenson R. Clarke, C.B., Borde Hill, Cuckfield. Flowers large, of bright orange-yellow, the sepals and petals veined and suffused with crimson, the labellum solid crimson, and with the margin frilled.

To *Cattleya* × 'Titianae,' Manor House var. (*Trianae* × 'Tityus') (votes unanimous), from Geo. Wm. Bird, Esq., The Manor House, West Wickham, Kent. Large flowers of model formation. In colour rosy-mauve, the labellum bright purple and with some yellow in the throat area.

To *Potinara* × *Juliettae*, Brockhurst var. (*S.-l.-c.* 'Marathon' × *B.-c.* 'Ena') (votes unanimous), from F. J. Hanbury, Esq., Brockhurst, East Grinstead. A brightly-coloured flower in which the segments are soft carmine-rose, the labellum ruby-coloured with golden venation in the throat.

Cultural Commendation.

To Messrs. Sutton Bros., Woodside Nurseries, Hassocks, for a specimen of *Odontoglossum naevium*, with seven spikes, each with about twenty flowers.

Other Exhibits.

Lady Aberconway and the Hon. H. D. McLaren: *Cymbidium* × 'Emery' var. 'Tangerine,' bronze-yellow, the lip whitish with some reddish markings.

G. W. Bird, Esq.: *Odontioda* × 'Purpura,' rose-tinted with dark-crimson blotches.

Lieut.-Col. Sir Geo. Holford: *Cymbidium* × 'Ringdove,' with a spike of twelve white flowers, the lip marked with red.

William Cursham, Esq., Thrumpton via Derby: *Odontoglossum* × 'Phyllis Cursham,' with a spike of twelve flowers of light bluish-purple colour.

Sir G. H. Kendrick, Whetstone, Edgbaston: *Dendrobium undulatum* and *D. tortile roseum*, a species which received F.C.C. in May 1865.

Messrs. Black & Flory: *Cattleya* × 'G. P. Walker,' of rose-pink colour, and *Brassocattleya* × 'Albion,' large and greenish-white.

Messrs. Charlesworth: *Odontioda* × 'Beryl,' with a spike of fifteen flowers in which the segments are bordered with rose-violet.

Messrs. Sutton Bros.: *Odontioda* × 'Grisell Lady Polwarth,' with reddish-crimson flowers, and *Odontoglossum crispum citrinum*, probably a natural hybrid.

ORCHID COMMITTEE, APRIL 7, 1926.

C. J. LUCAS, Esq., in the Chair, and fifteen other members present.

Awards Recommended:—

Silver Banksian Medal.

To Baron Bruno Schröder, Englefield Green, Surrey, for *Dendrobium* hybrids.

To Messrs. Cowan, Southgate, for species and hybrids.

To Messrs. Charlesworth, Haywards Heath, for hybrids.

Bronze Banksian Medal.

To J. J. Bolton, Esq., Claygate, for *Odontiodas* and other hybrids

First-class Certificate.

To *Cymbidium* × 'Goosander,' Westonbirt var. (votes 9 for, 1 against), from Lieut.-Col. Sir George Holford, K.C.V.O. The spike bore six roundly formed flowers of soft rose-pink colour, the labellum having a yellowish throat with some dark markings.

To *Brassolaeliocattleya* × 'Caligula' *magnifica* (votes unanimous), from Lieut.-Col. Sir George Holford, K.C.V.O. A large flower with broadly developed segments of rosy-mauve colour, the labellum dark purple, the margin undulated and minutely fringed.

To *Brassocattleya* × 'Mary J. S. Hanbury' (votes unanimous), from F. J. Hanbury, Esq., Brockhurst, East Grinstead. Of unknown parentage. A showy flower of large size, with the rich rosy-mauve colour evenly distributed throughout all the segments. The labellum has the frontal portion considerably developed, much undulated, and fringed at the margin.

To *Dendrobium* × *plumptonense magnificum* ('Cybele' × *nobile*) (votes unanimous), from Baron Bruno Schröder. Flowers of large size, with broadly developed segments, of mauve-purple on the apical half, the labellum with a dark crimson-purple blotch at the base, and with the apical margin mauve-purple.

Award of Merit.

To *Brassocattleya* × 'Grand Monarque' (*C. Schroederæ* × *B.-c.* × *Cliftonii*) (votes unanimous), from F. J. Hanbury, Esq. A beautiful hybrid of large size. In colour light blush, the labellum having the front portion purplish, with a narrow white border, the margin frilled, and an orange-yellow suffusion on each lateral lobe.

To *Odontioda* × 'Brackenhurst' var. 'Memoria J. Gurney Fowler' (votes 13 for, 1 against), from J. J. Bolton, Esq., Claygate, Surrey. The spike bore thirteen flowers of medium size, but remarkable for the dark-crimson colour; the labellum has a purplish margin and yellow crest.

To *Odontioda* × 'Rosaleen' (votes unanimous), from R. Gerrish, Esq., Milford Manor, Salisbury. The branched spike bore thirty flowers, with rose-purple spotting on the central area of the petals, and zones of the same colour on the marginal area, as well as on the sepals.

To *Odontoglossum* × 'Rosina,' Brockhurst var. (votes unanimous), from F. J. Hanbury, Esq. This attractive hybrid carried a spike of fourteen flowers, with bright red markings on a white ground, the labellum yellowish with white border.

Other Exhibits.

Messrs. Sanders, St. Albans: *Cirrhopetalum Wendlandianum*, *Maxillaria praestans*, and others.

Messrs. Black & Flory, Slough: *Cattleya* × 'Olympus,' and *Sophrocattleya* × 'Heatherwood.'

Messrs. Stuart Low, Jarvisbrook: *Laeliocattleya* × 'Sol,' apricot-yellow, the lip purplish.

ORCHID COMMITTEE, APRIL 20, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and fifteen other members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. Charlesworth, Haywards Heath, for group of choice hybrids.

First-class Certificate.

To *Coelogyne Lawrenceana* var. *superba* (votes 10 for, 3 against), from Messrs. Sanders, St. Albans. This species was named in honour of Sir Trevor Lawrence, and received an Award of Merit, March 28, 1905. The present example is a very much finer form, both in size and colour. Sepals and petals light buff-yellow, the labellum having an orange-coloured disc with several brownish fimbriate keels, while the lateral lobes are similarly tinged on the inner side.

Other Exhibit.

F. J. Hanbury, Esq.: *Odontioda* × 'Ganesa,' with a branched spike of over thirty buds and flowers.

ORCHID COMMITTEE, MAY 25, 1926.

AT CHELSEA.

SIR JEREMIAH COLMAN, Bt., in the Chair, and nineteen other members present.

[For Cups and Medals awarded by the Council after consultation with the Judges see p. xxv].

Awards Recommended:—

First-class Certificate.

To *Cattleya* × *Titiana*, The Dell Park var. ('Tityus' × *Trianae*) (votes unanimous), from Baron Bruno Schröder, Englefield Green, Surrey (gr. Mr. J. E. Shill). Of unusually large size, rosy mauve, the wide labellum rich purple, each of the side lobes having a bright golden area.

To *Odontoglossum crispum* var. 'Premier Disraeli' (votes unanimous), from J. J. Bolton, Esq., Claygate, Surrey (gr. Mr. S. Lyne). The spike bore ten flowers, with segments roundly formed, white, the labellum with a few reddish markings. A superb variety.

To *Cattleya* × *Wolterstiana* var. 'Rex' ('Queen Mary' × 'Rajah') (votes 12 for), from Messrs. Cowan, Southgate. The spike bore a couple of large flowers of uniform rose-purple, the labellum solid purple, except for a narrow margin of rose-tint.

Award of Merit.

To *Brassolaeliocattleya* × 'Caligula,' Gatton Park var. (votes 16 for, 1 against), from Sir Jeremiah Colman, Bt., Gatton Park, Surrey. A charming flower of large size and soft mauve-pink colour, the labellum of purple colour extending to the margin of the lateral lobes and in the throat; the tube has a yellow disc.

To *Cattleya* × 'Dr. M. Lacroze' var. 'Excelsior' (votes 10 for), from Robt. Paterson, Esq., Cathcart, Glasgow. A grand flower with the sepals and petals of light rose, the latter having a delicate venation, and the labellum with intense crimson on the frontal portion, the margin frilled and the throat yellow.

To *Miltonia* × 'Princess Elizabeth' var. *superba* (votes 16 for), from Messrs. Black & Flory, Slough. A distinct hybrid obtained from *Miltonia vexillaria* var. 'G. D. Owen,' and inheriting the well-known blotch on the labellum, but in a much enlarged state.

To *Cattleya* × 'Prince Shimadzu' var. *superba* ('Tityus' × *Hardyana*) (votes 16 for), from Robt. Paterson, Esq. Of excellent form, the petals overlapping in front of the dorsal sepal. Of rosy-mauve colour, the labellum ruby-crimson, with some yellow in the throat area.

To *Miltonia* × 'Lucia,' Stamperland var. (*vexillaria* × 'Princess Margaret') (votes unanimous), from Robt. Paterson, Esq. A promising hybrid with the sepals and petals deep crimson, the extensive labellum rich purple, with some darker veining and a brownish mask at the extreme base.

To *Laeliocattleya* × 'Chloris' var. 'Vivid' (*L. purpurata* × *L.-c.* × 'Gladiator') (votes 12 for), from Messrs. Sanders, St. Albans. The spike bore four large flowers of mauve colour with purplish venation of a deeper degree, the labellum crimson-purple. A distinct hybrid.

To *Odontonia* × *Pittiae*, Rosslyn var. (*M. Bleuana* × *O. Harryanum*) (votes 11 for), from H. T. Pitt, Esq., Stamford Hill. A richly coloured hybrid, with sepals and petals dark purple, mottled with white, the widely developed labellum solid purple, tinged with crimson.

To *Odontoglossum* × 'Tyntesfield' (unanimous), from Dr. F. Craven Moore, Victoria Park, Manchester. Of unrecorded parentage. The spike bore six large flowers of round formation and with lilac-rose blotches and confluent spotting.

Other Exhibits.

Baron Bruno Schröder: *Miltonia* × *Hyeana* var. 'Butterfly,' with four spikes of white flowers, the petals lightly flushed with purple and the lip with a crimson mask.

J. J. Bolton, Esq.: *Odontoglossum* × 'Monarch,' with a spike of eight large and handsomely blotched flowers, and to which F.C.C. was given in 1924; *Odontoglossum crispum* var. 'Aglais,' a fine white form, and *Odontoglossum* × *perculio-Solon*, with blotches of crimson-purple on the sepals and petals.

ORCHID COMMITTEE, JUNE 15, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Charlesworth, Haywards Heath, for thirty *Odontoglossum* hybrids flowering for the first time.

To Messrs. Sanders, St. Albans, for various species and hybrids.

To Messrs. Cowan, Southgate, for hybrids.

To Messrs. Stuart Low, for interesting species.

Award of Merit.

To *Odontonia* × 'Nubia' (*Miltonia Charlesworthii* × *Odontoglossum* 'Doreen') (votes 9 for), from Messrs. Charlesworth. The spike bore a couple of large flowers, spotted and blotched with purplish-crimson, the labellum broadly developed and flatly formed.

Botanical Certificate.

To *Dendrobium purpureum album* (votes 7 for), from Messrs. Sanders. The stout spindle-shaped stems form clusters of flowers, each about $\frac{1}{2}$ inch long, cylindrical, and, in the variety *album*, white tipped with light green.

Cultural Commendation.

To *Miltonia vexillaria* var. 'Snowflake,' from Lieut.-Col. Sir George Holford, K.C.V.O., Westonbirt, Tetbury, Glos. A finely cultivated specimen with twenty-two spikes and an aggregate of 111 snow-white flowers.

Other Exhibits.

Messrs. Black & Flory, Slough: *Miltonia* × 'Kennie' ('Venus' × *vexillaria* var. 'G. D. Owen'), rose-pink with darker veining, and three varieties of *Miltonia* × 'Princess Elizabeth.'

AMATEUR SHOW, JUNE 22, 1926.

Awards Recommended :—

Gold Medal.

To Sir Jeremiah Colman, Gatton Park, Surrey, for group of Orchids and ornamental plants.

Silver-gilt Banksian Medal.

To H. T. Pitt, Esq., Rosslyn, Stamford Hill, for group of Orchids.

In the class for Twelve Orchids, J. J. Bolton, Esq., Claygate, Surrey, was first, and H. T. Pitt, Esq., Rosslyn, Stamford Hill, second.

In the class for Six Orchids, E. R. Ashton, Esq., Camden Park, Tunbridge Wells, was first, A. M. Gentle, Esq., St. Albans, second, and H. G. Harrison, Esq., New Cross, third.

ORCHID COMMITTEE, JUNE 29, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Stuart Low & Co., Jarvisbrook, Sussex, for species and hybrids.

Other Exhibits.

J. J. Bolton, Esq.: several finely formed *Odontoglossum* hybrids.

Messrs. Sanders: *Aerides virens albanense*, with a many-flowered spike.

Messrs. Black & Flory: *Miltonia* × 'Elizabeth,' with a crimson blotch on the lip; also two varieties of *Miltonia* × 'Lena.'

Wm. Van de Weyer, Esq., Dorchester: a cut spike of *Lissochilus Horsfallii*, from a plant collected in the Belgian Congo.

NARCISSUS AND TULIP COMMITTEE.

FEBRUARY 9, 1926.

Mr. GEORGE MONRO, M.B.E., in the Chair, and eight other members present.

The Death of the Rev. Joseph Jacob.—The Chairman referred to the death on February 5 of the Rev. Joseph Jacob, who had been for many years a Member of the Committee, and the Secretary was requested to send a message of condolence from the Committee to the relatives.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. James Carter, Raynes Park, for Tulips.

NARCISSUS AND TULIP COMMITTEE, FEBRUARY 23, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. R. H. Bath, Wisbech, for Narcissi, Tulips, Hyacinths, Crocuses, etc.

Silver Banksian Medal.

To Messrs. Barr, Covent Garden, for Narcissi.

Award of Merit.

To *Narcissus* 'Cheerfulness,' for show purposes (votes 8 for, 3 against). Division IX. Double Poetaz variety. A double sport from 'Elvira.' Each stem carried a fair-sized cluster of rather large rounded flowers. The perianth and petaloid stamens were cream-coloured, while the broken corona was yellow. Shown by Mr. J. W. Barr, Wimborne. First arose in Van der Schoot's Nurseries.

NARCISSUS AND TULIP COMMITTEE, MARCH 9, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and fifteen other members present.

The late Lt.-Col. H. V. Warrender.—The Chairman referred to the regret they all felt at the death of Lt.-Col. H. V. Warrender, a former Member of the Committee, and the Secretary was instructed to send a letter of condolence.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Barr, Covent Garden, for Narcissi.

To Messrs. J. R. Pearson, Lowdham, for Narcissi.

Silver Banksian Medal.

To Messrs. Sutton, Reading, for Tulips.

To Messrs. R. H. Bath, Ltd., Wisbech, for Tulips and Narcissi.

First-class Certificate.

To *Narcissus* 'Medusa,' for garden decoration and for cutting or market purposes (votes 11 for, 0 against). (A.M. March 10, 1925.) Division VIII. A good-sized, white, well-shaped, fragrant Poetaz variety, with a distinctly cup-shaped, orange-coloured corona. Shown by Mr. P. D. Williams, St. Keverne. Raised by exhibitor.

Award of Merit.

To *Narcissus* 'Agnes,' as a show flower (votes 10 for, 0 against). Division VIII. A large-flowered Poetaz variety with broad white overlapping perianth segments and a deep orange cup. Raised & shown by Mr. P. D. Williams.

Other Exhibits.

Mr. J. W. Barr, Wimborne: *Narcissi*.

Messrs. Cartwright & Goodwin, Ltd., Kidderminster: *Narcissi*.

NARCISSUS AND TULIP COMMITTEE, MARCH 23, 1926.

Mr. GEORGE MONRO, M.B.E., in the Chair, and fourteen other members present.

The Classified List of Daffodil Names.—Mr. C. H. Curtis, the Hon. Registrar, reported that 230 new names had been registered since the last Classified List of Daffodil Names was published in 1923. It was resolved that the Council be asked to publish a new List at the end of the current season, and it was recommended that the award and the date on which it was given should be shown against those varieties which have received an A.M. or a F.C.C.

Awards Recommended :—

Gold Medal—to which the Council added its Congratulations.

To Mr. J. L. Richardson, Prospect Gardens, Waterford, for *Narcissi*.

Gold Medal.

To Messrs. the Donard Nursery Company, Newcastle, Co. Down, for *Narcissi*.

Silver-gilt Banksian Medal

To Messrs. Barr & Sons, Covent Garden, for *Narcissi*.

Silver Banksian Medal.

To Messrs. R. H. Bath, Ltd., Wisbech, for *Narcissi*.

To Mr. J. W. Barr, Three-legged Cross, Wimborne, for *Narcissi*.

To Messrs. James Carter & Co., Raynes Park, for *Narcissi*.

To Messrs. J. R. Pearson & Sons, Lowdham, for *Narcissi*.

Banksian Medal.

To Messrs. Cartwright & Goodwin, Kidderminster, for *Narcissi*.

First-class Certificate.

To *Narcissus* 'Beersheba,' as a show flower (votes 14 for, 0 against). (A.M. April 15, 1925.) Division I (b). A large pure-white Trumpet variety. Raised by Mr. Engleheart and shown by Mr. J. L. Richardson.

To *Narcissus* 'Glorious,' for cutting and market purposes (votes 13 for, 0 against). (A.M. March 27, 1923.) Division VIII. A Poetaz variety, bearing two or sometimes three flowers on a stem. The perianth is white, rounded, and flat, while the cup is of an orange-scarlet. Raised by Mr. J. C. Williams and shown by Mr. J. L. Richardson.

Award of Merit.

To *Narcissus* 'Grenade,' for cutting and market purposes (votes 7 for, 0 against) Division III (b). A bold, long-stemmed variety, with golden-yellow cup and paler perianth. Raised by Mr. Engleheart and shown by Mr. W. B. Cranfield.

To *Narcissus* 'Everest,' as a show flower (votes 12 for, 0 against). Division I (b). A white, long-trumpeted variety of good substance. Raised by Mr. G. Wilson and shown by the Donard Nursery Company.

To *Narcissus* 'Prospector,' for garden decoration and for cutting and market purposes (votes 10 for, 0 against). Division I (a). A large, deep golden-yellow Trumpet variety. Raised by Mr. Engleheart and shown by the Donard Nursery Company.

To *Narcissus* 'Baronet,' for cutting or market purposes (votes 13 for, 0 against). Division II (a). An *incomparabilis* variety, with deep yellow perianth and frilled orange mouth to the trumpet. Raised by The Brodie of Brodie from 'Bernardino' and 'King Alfred,' and shown by Messrs. H. Chapman, Ltd.

To *Narcissus* 'Duke of Normandy,' for cutting or market purposes (votes 8 for, 0 against). Division I (a). A very large, golden-yellow variety, with a particularly wide trumpet, and with broad perianth segments. Raised and shown by Mr. C. B. Blampied, La Fosse, St. Martins, Guernsey.

To *Narcissus* 'Alroi,' as a show flower (votes 14 for, 0 against). Division II (a). A large, well-formed, soft-yellow *incomparabilis* variety. Raised and shown by Mr. J. L. Richardson.

To *Narcissus* 'Fairy Circle,' as a show flower (votes 13 for, 1 against). Division IV (b). An aptly-named Leedsii variety, having a clearly defined pink rim to its flat white cup, and overlapping white perianth segments. Raised by The Brodie of Brodie and shown by Mr. J. L. Richardson.

To *Narcissus* 'Loyalist,' as a show flower (votes 12 for, 0 against). Division I (a). A robust but refined variety with golden-yellow trumpet and paler perianth. Raised and shown by Mr. J. L. Richardson.

To *Narcissus* 'Mitylene,' as a show flower (votes 13 for, 0 against). Division IV (a). A Leedsii variety with broad white perianth segments and a pale-yellow trumpet. Raised by The Brodie of Brodie and shown by Mr. J. L. Richardson.

To *Narcissus* 'Orange Brilliant,' as a show flower (votes 12 for, 0 against). Division X. A large, showy, double variety, with yellow perianth segments and a brilliant orange-coloured centre, from which protrude small yellow segments. Raised by Mrs. R. O. Backhouse and shown by Messrs. R. H. Bath, Ltd.

To *Narcissus* 'Advance Guard,' for cutting or market purposes (votes 12 for, 0 against). Division I (a). A fine golden-yellow variety, with a recurved rim to its long, wide trumpet. Raised and shown by Messrs. R. H. Bath, Ltd.

Preliminary Recognition.

To *Narcissus* 'Harpist,' as a show flower (votes 7 for, 0 against). Division I (a). Raised and shown by Mr. W. B. Cranfield.

Other Exhibit.

Mr. J. W. Jones: *Narcissus Bulbocodium tenuifolium*.

NARCISSUS AND TULIP COMMITTEE, APRIL 7, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and thirteen other members present.

Awards Recommended:—

Gold Medal—to which the Council added its Congratulations.

To Messrs. R. H. Bath, Ltd., for Narcissi.

Gold Medal.

To Messrs. Barr & Sons, Covent Garden, for Narcissi.

To Messrs. J. R. Pearson & Sons, Lowdham, for Narcissi.

Silver-gilt Banksian Medal.

To Messrs. Sutton & Sons, Reading, for Narcissi.

Silver Banksian Medal.

To Messrs. the Welsh Bulb Fields, St. Asaph, for Narcissi.

To Mr. W. F. M. Copeland, Shirley, Southampton, for Narcissi.

Banksian Medal.

To Mr. J. W. Barr, Wimborne, for Narcissi.

Award of Merit.

To *Narcissus* 'Ditty,' as a show flower (votes 8 for, 3 against). Division IX. A Poeticus variety of moderate size, but good form and substance. Raised and shown by Messrs. H. Chapman, Ltd., Rye.

To *Narcissus* 'Rosary,' as a show flower (votes 10 for, 0 against). Division I (c). A large bi-color Trumpet variety, the perianth being creamy-white and the trumpet primrose-yellow. Raised by Mr. Engleheart and shown by Messrs. Herbert Chapman, Ltd.

To *Narcissus* 'Paramount,' as a show flower (votes 12 for, 0 against). Division II (a). A very beautiful *incomparabilis* variety, with a soft-yellow perianth and a deep orange-coloured cup. Raised and shown by Messrs. H. Chapman, Ltd.

To *Narcissus* 'Nene Beauty,' as a show flower (votes 10 for, 0 against). Division II (b). A bi-color *incomparabilis* variety, with broad white perianth segments and a wide, flat, golden-yellow cup. Raised and shown by Messrs. R. H. Bath, Ltd., Wisbech.

To *Narcissus* 'Scarlet Beauty,' as a show flower (votes 13 for, 0 against). Division II (b). A bi-color *incomparabilis* variety, with broad creamy-white perianth segments and a wide bright-orange cup, which is almost scarlet at the rim. Raised by Mrs. Backhouse and shown by Messrs. R. H. Bath, Ltd.

To *Narcissus* 'Sybil,' for garden decoration (votes 11 for, 0 against). Division IV (a). A giant Leedsii variety with a white perianth and a sulphur-yellow cup. Raised and shown by Messrs. R. H. Bath, Ltd.

To *Narcissus* 'Elegance,' as a show flower (votes 12 for, 0 against). Division IV (a). A well-formed giant Leedsii variety with perianth and cup both white. Raised and shown by Messrs. R. H. Bath, Ltd. This is *not* the variety belonging to Division IV (b) in the 1923 Classified List. Both varieties were raised by Messrs. R. H. Bath, Ltd., but the variety listed in 1923 no longer exists.

Other Exhibits.

Messrs. J. Carter & Co., Raynes Park: Tulips and Lachenalias.

NARCISSUS AND TULIP COMMITTEE, APRIL 13, 1926.

Mr. E. A. Bowles, M.A., F.L.S., V.M.H., in the Chair, and twenty-two other members present.

The Peter Barr Memorial Cup.—The Secretary reported that there was only one nominee for the Peter Barr Memorial Cup, viz., Mr. Wm. Poupart, who had been proposed by Mr. Curtis and by Mr. Barr. Mr. Curtis now formally moved that it be a recommendation to the Council that the Peter Barr Memorial Cup be awarded to Mr. Wm. Poupart. The proposition was carried unanimously.

Awards Recommended:—

Gold Medal.

To Messrs. Barr, Covent Garden, for Narcissi.

To Messrs. the Donard Nursery Co., Newcastle, Co. Down, for Narcissi.

To Mr. J. L. Richardson, Prospect House, Waterford, for Narcissi.

To Messrs. Seymour Copley, Spalding, for Daffodils in Market Bunches.

Silver-gilt Banksian Medal.

To Messrs. J. R. Pearson, Lowdham, for Narcissi.

To Messrs. R. H. Bath, Wisbech, for Narcissi.

Silver Banksian Medal.

To The Welsh Bulb Fields, St. Asaph, for Narcissi.

To Mr. Guy L. Wilson, Broughshane, for Narcissi.

Banksian Medal.

To Mr. J. W. Barr, Wimborne, for Narcissi.

To Messrs. Cartwright & Goodwin, Kidderminster, for Narcissi.

To Mr. W. F. M. Copeland, Shirley, Southampton, for Narcissi.

To Mr. W. B. Cranfield, Enfield, Middlesex, for Narcissi.

First-class Certificate.

To *Narcissus* 'Red Rim,' for cutting and market purposes (votes 10 for, 0 against). Division IX. A large Poeticus variety, with broad white perianth segments and a wide, yellow, red-rimmed cup. Raised by Mr. Engleheart and shown by Mr. F. A. Secrett of Marsh Farm, Twickenham. (A.M. April 12, 1923).

Award of Merit.

To *Narcissus* 'Samaria,' as a show flower (votes 19 for, 0 against). Division IV (b). A Leedsii variety, with a white perianth and a small cup which is mainly white but has a greenish centre and a pale-yellow frilled rim. Raised by The Brodie of Brodie and shown by Messrs. Herbert Chapman, Ltd.

To *Narcissus* 'Papyrus,' for cutting or market purposes (votes 13 for, 0 against). Division IX. A Poeticus variety with a white perianth of good substance and a yellow cup having an orange-red rim. Raised by Mr. Engleheart and shown by Mr. F. A. Secrett.

To *Narcissus* 'Traboe,' as a show flower (votes 15 for, 0 against). Division III (a). A very refined Barrii variety, with a white perianth and a deep yellow orange-rimmed cup. Raised and shown by Mr. P. D. Williams, Lanarth.

To *Narcissus* 'Mulberry,' as a show flower (votes 12 for, 0 against). Division III (b). A Barrii variety, with white perianth segments suffused with orange at their bases and a flat deep-orange cup. Raised and shown by Mr. P. D. Williams.

To *Narcissus* 'Folly,' as a show flower (votes 10 for, 3 against). Division II (b). A large *incomparabilis* variety, with white, somewhat reflexed, perianth segments, and a short, broad, orange cup.

To *Narcissus* 'Seraglio,' as a show flower (votes 13 for, 0 against). Division III (a). A bold Barrii variety, with broad cream-coloured perianth segments suffused with orange at their bases and a wide orange cup. Raised by The Brodie of Brodie and shown by Mr. J. L. Richardson, Waterford.

To *Narcissus* 'White Sentinel,' as a show flower (votes 16 for, 0 against). Division IV (a). A large *incomparabilis* variety, with well-formed, broad, creamy perianth segments and a wide, primrose-yellow, lightly frilled cup. Raised by Mr. Engleheart and shown by Mr. J. L. Richardson.

To *Narcissus* 'Betha,' as a show flower (votes 16 for, 0 against). Division VIII. A bold Poetaz variety, carrying one or two flowers on a stem. The perianth is of a sulphur-yellow colour, and the cup is deep yellow tinted with orange. Raised and shown by Mr. W. Welchman, Birdbeck House, Upwell, Wisbech.

To *Narcissus* 'Valetta,' as a show flower (votes 16 for, 0 against). Division I (b). A beautiful Trumpet variety, with white perianth and trumpet, the latter having a frilled, lightly recurved rim. Raised by The Brodie of Brodie and shown by Mr. Guy L. Wilson, Broughshane, Co. Antrim.

To *Narcissus* 'Carmel,' as a show flower (votes 10 for, 0 against). Division I (c). A well-formed, bi-color Trumpet variety, with flat white perianth segments and a long, primrose-yellow, frilled trumpet. Raised by The Brodie of Brodie and shown by Mr. Guy L. Wilson.

NARCISSUS AND TULIP COMMITTEE, APRIL 20, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and eleven other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Barr & Sons, Covent Garden, for Narcissi.

Silver Banksian Medal.

To Messrs. R. H. Bath, Wisbech, for Narcissi and Tulips.

To Messrs. James Carter & Co., Raynes Park, for Tulips.

To Messrs. Herbert F. Chapman, Ltd., Rye, for Narcissi.

Other Exhibits.

Three Daffodils and four Tulips were exhibited for Certificate, but no award was recommended.

NARCISSUS AND TULIP COMMITTEE, MAY 4, 1926.

Mr. C. H. CURTIS in the Chair, and three other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Dobbie & Co., Edinburgh, for Tulips.

Silver-gilt Medal.

To Messrs. Barr & Sons, Covent Garden, for Tulips.

Silver Banksian Medal.

To Rev. R. Meyer, Watton Rectory, Hertford, for Tulips.

Banksian Medal.

To Messrs. R. H. Bath, Ltd., Wisbech, for Tulips.

To Major Fletcher, Bronwylfa Fruit Farm, St. Asaph, for Tulips.

To Messrs. The Welsh Bulb Fields, St. Asaph, for Tulips.

To Messrs. J. R. Pearson & Sons, Lowdham, for Tulips.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETING.

JULY 13, 1926.

Mr. W. A. BILNEY, J.P., V.M.H., in the Chair.

One hundred and fifty-eight Fellows and one Associate were elected, and one Society affiliated.

The Clay Challenge Cup, for a new Rose possessing the true old Rose scent, was awarded to Messrs. A. Dickson & Sons, Ltd., Belfast, for 'Dame Edith Helen.'

A lecture was given by Mr. H. J. Page on "The Alternatives to Farmyard Manure in the Private Garden."

GENERAL MEETING.

JULY 27, 1926.

Sir WILLIAM LAWRENCE, Bt., in the Chair.

Seventy-four Fellows were elected.

GENERAL MEETING.

AUGUST 10, 1926.

The Rt. Hon. The Lord LAMBOURNE, P.C., C.V.O., V.M.H., in the Chair.

Forty-six Fellows were elected.

GENERAL MEETING.

AUGUST 24, 1926.

Sir WILLIAM LAWRENCE, Bt., in the Chair.

Forty-one Fellows were elected.

The Foremarke Cup, for twenty spikes of named Gladioli, in not less than ten varieties, was awarded to Messrs. G. Mair & Sons, Prestwick.

DEPUTATION TO DUNDEE.

AUGUST 26, 1926.

A deputation of the Council of the Society visited the International Show at Dundee on August 26, 1926, and made awards as shown below.

The deputation consisted of Messrs. W. Cuthbertson, J.P., V.M.H., and T. Hay, V.M.H.

VOL. LII.

Awards.

Gold Medal.

To Messrs. James Carter & Co., Raynes Park, for vegetables.
 To Messrs. Dobbie & Co., Ltd., Edinburgh, for Roses and Dahlias.
 To Messrs. D. & W. Croll, Dundee, for flowers and vegetables.
 To Messrs. W. P. Laird & Sinclair, Aberdeen, for cut flowers.
 To Messrs. Storrie & Storrie, Glencarse, Perth, for fruit.
 To Messrs. Thyne & Son, Dundee, for cut flowers.

Veitch Memorial Medal in Silver and £5.

To the Earl of Strathmore (gr. Mr. D. McInnes), for Grapes.

Veitch Memorial Medal and £2 10s.

To Mr. Peter Donaldson, Station Cottage, Blackford, for vegetables.

GENERAL MEETING.

SEPTEMBER 7, 1926.

Mr. W. A. BILNEY, J.P., V.M.H., in the Chair.

Thirty-nine Fellows were elected.

A lecture was given by Miss E. Armitage on "Vegetation on the Amazons."

R.H.S. VEGETABLE SHOW.

SEPTEMBER 7, 1926.

JUDGES.

BULLOCK, A.	LOBJOIT, W. G., O.B.E., J.P.	WESTON, J. G.
DIVERS, W. H., V.M.H.	METCALFE, A. W.	WILKIN, H. T.
GILES, W. F.	SMITH, A. C.	WILSON, J.

Chief Awards.

Class 1.—Amateurs. Collection of Vegetables.

First Prize, Sutton Cup.

To Viscount Hambleden, Greenlands, Henley-on-Thames (gr. Mr. W. Turnham).

R.H.S. Challenge Cup, for the highest number of points gained at the Show.

To R. Chetwynd-Stapylton, Esq., Headlands, Berkhamsted (gr. Mr. W. Meager), who obtained 13 points.

HOLLAND PARK SHOW.

SEPTEMBER 21-23, 1926.

JUDGES.

BAKER, W. G.	HARRISON, A. T.
BEAN, W. J., I.S.O., V.M.H.	HARROW, G.
BECKETT, E., V.M.H.	HOLLAND, E. J., J.P.
BEDFORD, A.	HOWE, W.
BLISS, A. J.	KELLY, J. S.
BOWLES, E. A., M.A., F.L.S., V.M.H.	LADDS, F.
CAMPBELL, D.	MCLEOD, J. F.
CHURCHER, MAJOR G.	MOORE, DR. F. CRAVEN.
COBB, A. J.	MUSGRAVE, C. T.
COMBER, J.	PAGE, COURTNEY.
COOK, C. H.	SHILL, J. E.
CORY, R., F.L.S.	SMITH, W. T.
COUTTS, J.	STEVENSON, T.
CRANFIELD, W. B.	WALLACE, W. E.
EARL, W. J.	WETTERN, H. L.
HALES, W., A.L.S.	WILSON, GURNEY, F.L.S.

Awards.

CHALLENGE CUPS.

Wigan Cup for the best exhibit of Roses.

To Messrs. S. McGredy & Son, Portadown, Ireland.

FRUIT.

Gold Medal.

To Messrs. G. Bunyard & Co., Ltd., Maidstone, for hardy fruits.

Silver-gilt Hogg Medal.

To The Barnham Nurseries, Ltd., for Apples and Pears.

Bronze Hogg Medal.

To Messrs. Daniels Bros., Ltd., for fruit.

ROSES.

Gold Medal.

To Messrs. S. McGredy & Son, Portadown, for Roses.

Silver-gilt Flora Medal.

To Mr. T. Robinson, for Roses.

Silver-gilt Banksian Medal.

To Messrs. Alex. Dickson & Sons, Ltd., Belfast, for Roses.

To Mr. John Mattock, Headington, for Roses.

To Mr. George Prince, Longworth, for Roses.

Silver Flora Medal.

To Messrs. B. R. Cant & Sons, Ltd., Colchester, for Roses.

To Mr. J. H. Pemberton, Romford, for Roses.

Silver Banksian Medal.

To Messrs. Chaplin Bros., Ltd., Waltham Cross, for Roses.

To Mr. Elisha J. Hicks, Twyford, Berks, for Roses.

Banksian Medal.

To Messrs. D. Prior & Son, Ltd., Colchester, for Roses.

To Messrs. A. Warner & Son, Colchester, for Roses.

ORCHIDS.

Silver-gilt Flora Medal.

To Messrs. Black & Flory, Slough, for Orchids.

To Messrs. Cowan & Co., Southgate, for Orchids.

Silver-gilt Banksian Medal.

To Messrs. Stuart Low & Co., Enfield, for Orchids.

GLADIOLI.

Silver-gilt Banksian Medal.

To Messrs. Austin & McAslan, Glasgow, for Gladioli.

Silver Flora Medal.

To Mr. Alfred Edwards, Fordham, for Gladioli.

Silver Banksian Medal.

To Messrs. R. H. Bath, Ltd., Wisbech, for Gladioli.

DAHLIAS.

Gold Medal.

To Messrs. Dobbie & Co., Ltd., Edinburgh, for Dahlias.

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Silver Cup.

- To Messrs. Dickson & Robinson, Manchester, for Dahlias.
- To Messrs. Jarman & Co., Chard, for Dahlias.
- To Mr. H. J. Jones, Lewisham, for Dahlias.

Silver-gilt Flora Medal.

- To Mr. J. B. Riding, Chingford, for Dahlias.
- To Messrs. J. Stredwick & Son, St. Leonards, for Dahlias.
- To Mr. J. T. West, Brentwood, for Dahlias.
- To Mr. H. Woolman, Birmingham, for Dahlias.

Silver-gilt Banksian Medal.

- To Messrs. Carter Page & Co., Ltd., for Dahlias.

Silver Flora Medal.

- To Messrs. W. Treseder, Ltd., Cardiff, for Dahlias.

Banksian Medal.

- To Mr. C. Turner, Slough, for Dahlias.

CARNATIONS.

Silver Cup.

- To Messrs. Allwood Bros., Haywards Heath, for Carnations.
- To Mr. C. Engelmann, Saffron Walden, for Carnations.

Silver Banksian Medal.

- To Messrs. Stuart Low & Co., Enfield, for Carnations.

GREENHOUSE PLANTS.

Silver Cup.

- To A. P. Brandt, Esq., for stove and greenhouse foliage plants.
- To Messrs. L. R. Russell, Ltd., for Tree Ferns and other foliage plants.

Silver-gilt Flora Medal.

- To Messrs. Stuart Low & Co., Enfield, for greenhouse plants.
- To Messrs. Blackmore & Langdon, Bath, for Begonias.

Silver-gilt Banksian Medal.

- To Messrs. John Peed & Son, West Norwood, for greenhouse plants.

MICHAELMAS DAISIES, CHRYSANTHEMUMS, ETC.

Silver Cup.

- To Mr. J. W. Forsyth, Putteridge, for Chrysanthemums.
- To Mr. H. J. Jones, Lewisham, for Michaelmas Daisies and Helianthus.

Silver-gilt Flora Medal.

- To Messrs. K. Luxford & Co., Harlow, for Chrysanthemums.
- To Mr. W. Sydenham, Derby, for Michaelmas Daisies.

Silver-gilt Banksian Medal.

- To Mr. E. Ballard, Colwall, for Michaelmas Daisies.
- To Messrs. Barr & Sons, Covent Garden, for Michaelmas Daisies.
- To Mr. W. Yandell, Maidenhead, for Chrysanthemums and Violas.

Silver Flora Medal.

- To Mr. T. Bones, Cheshunt, for Michaelmas Daisies.

Flora Medal.

- To Maytham Gardens, Rolvenden, for Michaelmas Daisies.

Banksian Medal.

- To Messrs. G. Bunyard & Co., Ltd., Maidstone, for Michaelmas Daisies.

SHRUBS.

Silver Cup.

To Messrs. Hillier & Sons, Winchester, for trees, shrubs and climbing plants.

Silver-gilt Flora Medal.

To Messrs. J. Cheal & Sons, Crawley, for shrubs.

To Mr. G. Reuthe, Keston, for shrubs.

To Messrs. J. Waterer, Sons & Crisp, Ltd., Twyford, for conifers and berried shrubs.

Silver-gilt Banksian Medal.

To Messrs. A. Charlton & Sons, Rotherfield, for trees and shrubs.

To Messrs. Hollamby's Nurseries, Groombridge, for trees and shrubs.

To Mr. R. C. Notcutt, Woodbridge, for shrubs.

Silver Flora Medal.

To Messrs. Fletcher Bros., Ltd., Ottershaw, for conifers and berried shrubs.

To The Orpington Nursery Co., Orpington, for shrubs.

To Messrs. Maxwell & Beale, Broadstone, for hardy Heathers and shrubs.

Silver Banksian Medal.

To Mr. John Klinkert, Richmond, for topiary.

Flora Medal.

To Messrs. Harrods, Ltd., Knightsbridge, for Bay, Yew and Box trees.

Banksian Medal.

To Mr. J. C. Allgrove, Slough, for berried shrubs.

To Messrs. Robert Green, Ltd., London, for Bay trees.

MIXED GROUPS.

Silver-gilt Flora Medal.

To Messrs. James Carter & Co., Raynes Park, for Lilies, Gladioli, etc.

To Messrs. Clarence Elliott, Ltd., Stevenage, for rock garden.

To Messrs. Jackman & Son, Woking, for herbaceous plants and Clematis.

To Mr. Gavin Jones, Letchworth, for rock plants and dwarf shrubs.

To Messrs. Maxwell & Beale, Broadstone, for rock plants and dwarf conifers.

To Mr. Amos Perry, Enfield, for hardy Ferns and bulbous plants.

To Messrs. M. Prichard & Sons, Christchurch, for herbaceous plants.

To Messrs. R. Wallace & Co., Ltd., Tunbridge Wells, for shrubs, herbaceous and bulbous plants.

Silver-gilt Banksian Medal.

To Messrs. Blackmore & Langdon, Bath, for Phloxes and Delphiniums.

To Messrs. Fairbairn & Son, Carlisle, for Phloxes.

To Messrs. J. Forbes, Ltd., for Phloxes, Pentstemons and Dahlias.

To Messrs. Hewitt & Co., Solihull, for Delphiniums.

To Mr. W. E. T. Ingwerson, East Grinstead, for rock plants and dwarf conifers.

To Mr. James MacDonald, Harpenden, for grass garden.

To Mr. Amos Perry, Enfield, for herbaceous and bulbous plants.

To Messrs. L. R. Russell, Ltd., Richmond, for Clematis.

Silver Flora Medal.

To Messrs. House & Son, Bristol, for Scabious and Kniphofias.

To Mr. W. Wells, jun., Merstham, for herbaceous plants.

To Mr. F. G. Wood, Ashted, for rock plants and dwarf shrubs.

Silver Banksian Medal.

To Messrs. W. Artindale & Son, Sheffield, for herbaceous plants.

To Mr. R. J. Case, Taunton, for Pelargoniums and herbaceous plants.

To Messrs. R. & G. Cuthbert, Southgate, for Lilies, Nerines, etc.

To Messrs. Lowe & Gibson, Crawley, for Gladioli and Delphiniums.

To Messrs. B. Ladhams, Ltd., Southampton, for Lobelias and hardy plants.

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Flora Medal.

To Messrs. Bakers, Ltd., Codsall, for herbaceous plants.

To Messrs. G. Bunyard & Co., Ltd., Maidstone, for Dahlias and herbaceous plants.

To Messrs. W. H. Simpson & Sons, Birmingham, for Antirrhinums, Michaelmas Daisies, etc.

To Mr. S. Smith, Enfield, for cacti and succulents.

To Messrs. J. Waterer, Sons & Crisp, Ltd., Twyford, for herbaceous plants.

Banksian Medal.

To Messrs. Bowell & Skarratt, Cheltenham, for herbaceous plants.

To Central Garden Supplies, Kenton, for rock plants.

To Messrs. Daniels Bros., Norwich, for Montbretias, Gladioli, etc.

To Messrs. G. Gibson & Co., Bedale, for herbaceous plants.

To Mr. H. Hemsley, Crawley, for Dahlias and herbaceous plants.

To Orpington Nurseries, Orpington, for Gladioli and Delphiniums.

To Messrs. Rogers & Son, Ltd., Southampton, for herbaceous and rock plants.

To Messrs. Sutton & Sons, Reading, for Zinnias.

GENERAL MEETING.

OCTOBER 5, 1926.

Mr. G. YELD, M.A., V.M.H., in the Chair.

One hundred and forty-six Fellows and fourteen Associates were elected, and three Societies affiliated.

A lecture was given by Mr. E. A. Bunyard, F.L.S., on "French Gardening Literature."

R.H.S. FRUIT SHOW.

OCTOBER 12-13, 1926.

JUDGES.

ALLGROVE, J. C.
ANDERSON, G. F.
BARNES, N. F., V.M.H.
BASHAM, J.
COBB, A. J.
COOK, C. H.
CRUMP, W., V.M.H.
DIVERS, W. H., V.M.H.
EARL, W. J.
GOODACRE, L. P.
JEFFERY, J.
JORDAN, F.
LAXTON, E.
LOBJOIT, W. G., O.B.E., J.P.
MCINNES, D.

MARKHAM, H.
METCALFE, A.
NEAL, E.
PATEMAN, T.
PEARSON, A. H., V.M.H.
POUPART, W., V.M.H.
RAWES, A.
RIVERS, H. S.
SMITH, A. C.
VEITCH, P. C. M., V.M.H.
WAKELY, C.
WESTON, J. G.
WHITING, A.
WILSON, J.
WOODWARD, G.

Chief Awards.

Gordon-Lennox Cup, for the most meritorious display of Fruit by an Amateur.

To Major Wingfield Digby (gr. Mr. E. Hill), Sherborne Castle, Dorset.

George Monro Memorial Cup, for the best exhibit of Grapes by an Amateur.

To Duke of Newcastle (gr. Mr. S. Barker), Clumber, Worksop.

Affiliated Societies Challenge Cup, for Apples and Pears.

To the North Walsham and District Horticultural Society.

Class 1.—Amateurs. Collection of nine dishes of ripe dessert fruits.

First Prize, Silver Hogg Medal and £9.

To Duke of Newcastle (gr. Mr. S. Barker), Clumber, Worksop.

Class 2.—Amateurs. Collection of six dishes of ripe dessert fruits.

First Prize, Silver Hogg Medal and £6.

To Major Wingfield Digby (gr. Mr. E. Hill), Sherborne Castle, Dorset.

Class 3.—Amateurs. Collection of twelve bunches of Grapes, four varieties.

First Prize, Silver Hogg Medal and £15.

To Duke of Newcastle (gr. Mr. S. Barker), Clumber, Worksop.

Class 14.—Amateurs. Collection of hardy fruits.

First Prize, Silver Hogg Medal and £15.

To Major Wingfield Digby (gr. Mr. E. Hill), Sherborne Castle, Dorset.

Class 17.—Trade. Collection of hardy fruits.

Silver-gilt Hogg Medal.

To Messrs. Laxton Bros., Bedford.

Class 20.—Market Growers. Six British standard boxes of Apples.

Silver Hogg Medal and £6.

To the Hollesley Bay Labour Colony.

Class 24.—Market Growers. Four chip baskets of Grapes.

First Prize, a Silver Cup.

To Messrs. J. Almond & Son, Effingham, Surrey.

GENERAL MEETING.

OCTOBER 19, 1926.

The Rt. Hon. The Lord LAMBOURNE, P.C., C.V.O., V.M.H., in the Chair.

Seventy-four Fellows and four Associates were elected, and one Society affiliated.

IMPERIAL FRUIT SHOW.

OCTOBER 29 TO NOVEMBER 6, 1926.

Awards made at the Imperial Fruit Show, held at the Holland Park Hall.

Gold Medal.

To Mr. H. Granger, Maldon, for the best four boxes of 'Cox's Orange,' in the United Kingdom Section.

To Mr. W. L. Taylor, Chelmsford, for the best four boxes of 'Worcester Pearmain,' in the United Kingdom Section.

GENERAL MEETING.

NOVEMBER 2, 1926.

Professor Sir JOHN FARMER, M.A., LL.D., D.Sc., F.R.S., in the Chair.

Sixty-four Fellows and one Associate were elected, and one Society affiliated.

A Masters Memorial Lecture was given by Professor F. O. Bower, D.Sc., LL.D., F.R.S., on "Plants in contrast to Animals." (See p. 194.)

GENERAL MEETING.

NOVEMBER 16, 1926.

The Rt. Hon. The Lord LAMBOURNE, P.C., C.V.O., V.M.H., in the Chair.

Fifty-five Fellows were elected, and two Societies affiliated.

GENERAL MEETING.

NOVEMBER 30, 1926.

The Rt. Hon. The Lord LAMBOURNE, P.C., C.V.O., V.M.H., in the Chair.

Fifty-four Fellows were elected, and two Societies affiliated.

GENERAL MEETING.

DECEMBER 14, 1926.

Dr. J. A. VOELCKER, M.A., F.I.C., F.L.S., in the Chair.

Sixty Fellows were elected, and two Societies affiliated.

A Masters Memorial Lecture was given by Professor F. O. Bower, D.Sc., LL.D., F.R.S., on "Plants in contrast to Animals." (See p. 196.)

SCIENTIFIC COMMITTEE.

JULY 13, 1926.

Sir DAVID PRAIN, F.R.S., V.M.H., in the Chair, and eight other members present.

Narcissus bulbs with droppers.—Mr. Bowles showed several bulbs of daffodils from Mr. Tate of Portugal (near Oporto), in which the daughter bulb had been produced some distance below the mother, much in the same way as occurs in *Galanthus* at times. Mr. Worsley said many Andean bulbs behaved in this fashion.

Rose of Jericho.—Mr. G. W. E. Loder showed specimens of the Rose of Jericho (*Anastatica*) and a plant which was being sold in London at the present time under the same name. This plant, more properly called the Resurrection Plant, is *Selaginella lepidophylla* (*Lycopodium lepidophyllum*), a native of Mexico, possessing in common with the Rose of Jericho the power of contracting into a globular mass on drying and expanding into a spreading plant on moistening.

Double Odontoglossum.—Mr. C. J. Lucas, of Warnham Court, sent a flower of an *Odontoglossum* with a double labellum.

Galls on Verbascum.—Mr. Hales showed plants of *Verbascum nigrum* with galls formed from axillary buds very similar to those sometimes seen in *Schizanthus* and attributed to the bacillus of Crown Gall (*Bacillus tumefaciens*).

Monstrous Foxglove.—Mr. Fraser showed a terminal flower of the form of *Digitalis purpurea* known as *monstrosa* with corollas and stamens growing from the middle of the capsule.

Dialysed Foxglove.—An inflorescence of the common foxglove (white flowered) was sent from Stevenage. Every flower had the corolla divided to the base into narrow segments. One plant of this type had occurred last year in this garden and four in the present season.

Fuchsia with half foliose sepals.—Mr. Fraser also showed a *Fuchsia* flower with two sepals half foliose.

Cedars diseased.—Mr. Wood showed shoots of Cedar from Hayes Place, Kent, with the basal part constricted and dead, the upper part having increased in diameter beyond the lower, but eventually, as the water supply through the dead part ceased, also dying.

Malformed Poppy.—A curiously malformed flower of *Papaver orientale* came from Mr. Ewan Cox. It had in the place of some of the stamens produced a number of small separate carpels. Similar malformations had been before the Committee on other occasions.

SCIENTIFIC COMMITTEE, JULY 27, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and six other members present.

Chlorosis in Willows.—Mr. Fraser showed *Salix Capraea* and *S. cinerea* exhibiting chlorosis, and remarked that the red hairs on *S. cinerea* were still normal. Mr. Bowles stated that plants which disliked lime were often found growing in "pot holes" over limestone formation, as was the case with *Rhododendron ferrugineum* on Mt. Cenis.

Correct Naming of Certificated Plants.—Mr. Worsley referred to the desirability for the authentication of the nomenclature of plants receiving the awards of the Society. Mr. Loder stated that this matter had recently received the consideration of the Council, who had arranged that the Botanist of the Society should be present at the Meetings to deal with doubtful cases.

Variability in colour of Dahlia.—Mr. J. T. Cormick sent *Dahlia* 'Union Jack' with parti-colour flowers, stating that last year it was self-coloured.

A Diseased Apple attacked by *Sclerotinia fructigena* came from Mr. E. P. Watson.

Etiolated Vine shoots were sent up from the Fruit Committee. It was stated that though the shoots were etiolated the bunch of grapes coloured black. The colouring of grapes usually occurred irrespective of light.

SCIENTIFIC COMMITTEE, AUGUST 10, 1926.

Mr. F. J. HANBURY, F.L.S., V.M.H., in the Chair, and four other members present.

Phlox paniculata.—Mr. Hosking showed root cuttings of *Phlox paniculata* bearing abnormal flowers.

Wild flowers.—Mr. Marsden-Jones showed an interesting collection of curious wild flowers, including colour forms of *Scabiosa succisa*, *Erica cinerea*, *Trifolium subterraneum*, *T. fragiferum*, *Vicia lathyroides*, *Centaurea Scabiosa*, *Alyssum officinalis*, *Salvia pratensis*, *Fragaria elatior*, *Cnicus eriophorus* (also *Dianthus Knappii* from Sofia).

Plants from Blakeney.—Mr. Hanbury showed plants from Blakeney, Norfolk, viz. *Statice reticulata caspia*, *Sueda maritima*, *S. fruticosa*, *Lactuca scariosa* and shoots of *Mertensia maritima*.

Wheat-eared Carnation.—Messrs. Barr sent a specimen of 'Wheat-eared' Carnation.

Fasciated Epilobium.—Mr. C. G. Geff sent specimens of fasciated *Epilobium* found growing on Box Hill.

SCIENTIFIC COMMITTEE, AUGUST 24, 1926.

Sir DAVID PRAIN, F.R.S., V.M.H., in the Chair, and six other members present.

The late Mr. W. Fawcett.—The Chairman referred to the death of Mr. W. Fawcett, F.L.S., and moved that an appreciation of his past services be recorded in the Minutes.

Chlorosis.—Mr. Odell stated that this year he had made further observations on the chlorosis of plants growing in the district between Newmarket and Cambridge to which he drew attention in 1925, and found it had largely increased, although the cause was not evident.

Change of colour pigments in plants.—Mr. Worsley said that he had had under observation a bed of Fuchsias, and that, unlike the cases to which Prof. Armstrong drew attention in the Dahlia at a former meeting, the flowers upon fading became redder, and not bluish. Sir David Prain remarked on the change in *Ipomoea rubrocoerulea* flowers which were blue on opening, fading to red, and said that if the red flowers of *Hibiscus rosasinensis* were placed in ammonia they became blue. It was proposed by Mr. Worsley, seconded by Mr. Hosking, and carried unanimously that the Council be asked what steps, if any, had been taken of the suggestion of the Scientific Committee that research in this subject be undertaken at Wisley.

Non-opening of flowers of Pelargonium.—Mr. Hosking sought information as to the cause for the flower of *Pelargonium* 'New Life' failing to open. It was suggested that anatomical research might reveal this. The Chairman remarked that it was a well-known fact that certain plants which had been cultivated for their uses through a long period of time had either partially, or entirely, lost their power of producing flowers, e.g. *Piper Betel*, 'Patchouli,' species of *Andropogon* and *Zizania*, and also the variety of *Amorphophallus campanulatus* which is used as a vegetable in the East.

Pincushion Moss.—Mr. Fraser showed *Leucobryum glaucum* which had grown into a "cushion" and was green on both sides. He also showed the stalks from a bunch of grapes which had lost their berries from a fungoid growth (Mr. Cotton took these for identification).

Aberrant Helenium.—Flowers of *Helenium autumnale* showing chloranthly were sent by Mr. F. S. Scruby.

SCIENTIFIC COMMITTEE, SEPTEMBER 7, 1926.

Mr. A. WORSLEY in the Chair, and six other members present, with Messrs. H. McMILLAN and F. WEST (visitors).

Vines without grapes.—Mr. Cotton sent a report that he had examined the grape stalks exhibited at the last meeting and had found one or two saprophytic moulds but no *Exobasidium vitis*, which had been suggested as the cause of the trouble.

Various exhibits.—Mr. E. Marsden-Jones showed diseased laurel shoots, and also *Scabiosa anthemifolia* from S. Africa.

Mrs. Arthur Bray sent shoots of Cherry which had died back through "gumming."

Variations in Pelargoniums.—Mr. Hosking showed specimens of *Pelargonium zonale* 'New Life,' a variety reputed to have originated in the Isle of Wight about 1876 as a sport from 'Vesuvius.' Normally the flowers are single red with irregular white strips on the petals. The plants shown, although in a healthy condition and producing an abundance of flower buds, yet fail to develop flowers. Up to the present the plant has resisted all attempts at propagation by root cuttings. This variety is figured in *The Floral Magazine*, 1877, tab. 288.

Pelargonium zonale 'Double New Life,' a variety introduced in 1892 by H. Cannell and Sons, said to have arisen as a sport from a double-flowered 'Vesuvius' called 'Wonderful.' The flowers are double, with the centre florets red, white and flaked. This variety when selfed produces single red flowers, indistinguishable from the ordinary 'Vesuvius,' and, grown from root cuttings, single red-flowered plants have also arisen.

Pelargonium 'Mangles' Variegated' or 'Mangles' Silver Leaf,' and also known as *Pelargonium* 'Manglesii,' a variety of free-spreading and slender habit; leaves broad, flat, lobed, irregularly white edged; flowers small, pale pink. In the *Cottage Gardener*, vol. 13, 1855, p. 499, will be found a reference to this plant. "A natural sport from a thin-leaved horseshoe pink-flowered species, which will not breed with any other species," and in vol. 16, 1856, p. 45, is a note by Donald Beaton: "That beautiful sport called Mangles' Variegated appeared little more than twenty years since, in the garden of Captain Mangles at Sunninghill. When well done it is the best of all our variegated Geraniums yet." At Merton the plant occasionally produces green-leaved sports, and when propagated by root cuttings also produces green-leaved plants, strong and vigorous with flowers identical with those of the parental variegated form. Specimens of the green form were submitted to Kew this year for identification and were declared to be "a good match of *Pelargonium alchemillodes*, Ait., a common S. African species." At Merton another form with the variegation less distinct is grown under the name of *Menziesii*, a name, however, which cannot be traced in catalogues or books. This plant also produces green-leaved sports spontaneously and from root cuttings identical with those produced by 'Mangles' Variegated.'

Pelargonium 'Madame Salleron,' a plant also known as 'Madame Salleroi,' 'Madame Salleroy,' 'Little Trot,' etc. This variety has white-margined leaves, and is of a very compact and dwarf habit. The internodes do not lengthen as in 'Mangles' Variegated' and in this its normal condition. When, however, it develops green-leaved sports and when grown from root cuttings the internodes lengthen and the plants attain a height of fully three feet and produce small pink flowers, similar to 'Mangles' Variegated'—see *Gardeners' Chronicle*, 1923, vol. ii. p. 364, for figure. According to H. Dauthenay, "Les Geraniums," p. 164, published in Paris in 1897, this variety originated in 1877 in the garden of Madame Salleron, Melun, as a sport from a bed of 'Mangles' Variegated.' It is interesting to note that 'Mangles' Variegated,' *Menziesii*, and 'Madame Salleron' not only produce green-leaved sports but also white-leaved sports, which of course quickly die.

SCIENTIFIC COMMITTEE, OCTOBER 5, 1926.

Sir DAVID PRAIN, F.R.S., V.M.H., in the Chair, and ten other members present.

Colour in Dahlias.—Prof. Armstrong said that two distinct colouring substances appeared to be present in Dahlias. In the so-called wild forms of *variabilis*, reds alone without a backing of red occurred, in others reds backed with yellow. There is considerable doubt whether any of the wild types from which the modern Dahlia has been developed, except possibly *D. furazensis*, are in cultivation. *D. Merckii* shows both red and blue, and *D. imperialis*, which is in cultivation, rarely flowers. The Committee hope that it will be possible to secure seeds of indubitably wild forms for cultivation and study at Wisley.

The Blackening of foliage upon drying.—Prof. Armstrong said that the substance producing the blackening of foliage upon drying seen in *Baptisia australis*, certain forms of *Trifolium*, etc., had been isolated and proved to be the same in a large number of plants.

Amaryllis.—An *Amaryllis* was shown by Mr. Worsley, who had thought it might possibly be *Amaryllis blanda*. It had been imported from South Africa, but did not agree in the less widely expanded mouth of the perianth with that plant as figured in the *Botanical Magazine*.

Variation in Polypodiums.—Mr. Wright of Auckland, New Zealand, showed a series of fronds of *Polypodium Billiardieri* from that country to illustrate the wide range of variation in degree of incision and lobing of the leaves to which that species is subject.

Galls on Rose.—Mr. Cutbush sent a shoot of a rose having galls upon it near the buds similar in appearance to those produced by the root-knot bacterium, usually but not invariably occurring upon roots or underground stems.

SCIENTIFIC COMMITTEE, OCTOBER 19, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and ten other members present.

Anona fruits.—Miss Benest of Woolpit, Suffolk, sent fruits of the custard apple which she had raised from seed in England.

Salix aurita.—Mr. Fraser showed numerous specimens of forms of *Salix aurita* to illustrate the variation which occurs within the limits of this species.

Many-leaved Clovers.—Dr. Voelcker showed examples of red clover with more than the usual number of leaflets, and said Messrs. Sutton found that a race in their possession gave about 5 per cent. of 3 leaflets, 25 per cent. of 4 leaflets, 5 per cent. of 7 leaflets, and about 50 per cent. of 5 leaflets. He also showed clover leaflets of the acidal form.

Aphis on Ranunculus root.—Mr. Marsden-Jones showed roots of *Ranunculus* attacked by an aphis (*Protrama radialis* Kalt.) which was taken to Wisley for investigation.

Beet—ready crossing.—He also showed mangold and beet-like seedlings of *Beta maritima* raised from a plant in his garden which had evidently been crossed from garden beet and mangold flowering some 50 yards distant.

Exhibit illustrating the origin of seeds.—Messrs. Dobbie exhibited a series of roots of vegetables to illustrate the methods used in developing reliable strains of these vegetables. The Committee unanimously recommended a Certificate of Appreciation to be awarded to Messrs. Dobbie in recognition of the educational value of their exhibit.

SCIENTIFIC COMMITTEE, NOVEMBER 2, 1926.

Mr. A. WORSLEY in the Chair, and three other members present.

There was no business before the meeting on this occasion.

SCIENTIFIC COMMITTEE, NOVEMBER 16, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and seven other members present.

White-flowered plants.—Mr. Worsley remarked that many white-flowered plants bred true from seed, and instanced *Nerine flexuosa alba*, which had come true for three generations. Mr. Bowles remarked that the white form of *Geranium Robertianum* also bred true.

SCIENTIFIC COMMITTEE, DECEMBER 14, 1926.

Mr. E. A. BOWLES, M.A., F.L.S., V.M.H., in the Chair, and seven other members present.

Mentha aquatica var. *austriaca*.—Mr. Fraser collected a narrow-leaved form of *Mentha arvensis* var. *austriaca* in four different stations, cultivated one of them for four years, and found that it retained its chief characters, though the leaves were larger.

FRUIT AND VEGETABLE COMMITTEE.

JULY 13, 1926.

Mr. C. G. A. Nix, V.M.H., in the Chair, and seven other members present.

No awards were recommended on this occasion.

Exhibits.

Mr. F. T. Mattocks, Rainham : Cherry 'Eric Perfection.'

Sir Wm. Lawrence, Bt., Burford : uncommon vegetables.

FRUIT AND VEGETABLE COMMITTEE, JULY 27, 1926.

Mr. C. G. A. Nix, V.M.H., in the Chair, and nine other members present.

Awards Recommended :—*Gold Medal.*

To Mr. J. C. Allgrove, Langley, Slough, for Gooseberries and Currants.

To Messrs. Barr, Covent Garden, for vegetables.

Silver Bunyard Medal.

To F. C. Stoop, Esq. (gr. Mr. G. Carpenter), Byfleet, for Gooseberries.

Other Exhibits.

Miss J. Elliston, Ashted : sport from Grape 'Black Hamburg.'

Messrs. H. Hemsley, Crawley : Gooseberries.

Mrs. E. Allen, Stroud : Raspberry.

FRUIT AND VEGETABLE COMMITTEE, AUGUST 10, 1926.

Mr. C. G. A. Nix, V.M.H., in the Chair, and eight other members present.

Awards Recommended :—*Silver Hogg Medal.*

To Messrs. Geo. Bunyard, Maidstone, for fruit.

To Messrs. Lane, Berkhamsted, for Vines in pots.

Silver Bunyard Medal and Cultural Commendation.

To Rt. Hon. Lord Leconfield (gr. Mr. F. Streeter), Petworth Park, for Peaches and Nectarines, etc.

Other Exhibits.

Messrs. Spooner, Hounslow : Apples.

Sir J. Findlay, Bt., Aberlour, Banffshire : Melon 'Aberlour Standfast.'

Mr. A. Humphrey, Hanfield : Melon 'Epicure.'

FRUIT AND VEGETABLE COMMITTEE, AUGUST 24, 1926.

Mr. J. CHEAL, V.M.H., in the Chair, and ten other members present.

Awards Recommended :—*Gold Medal.*

To Baron Bruno Schröder, Englefield Green : for fruit.

Silver Bunyard Medal.

To Mr. R. Staward, Ware : for Plums.

Plum 'Bountiful,' sent by Messrs. Laxton, Bedford, was recommended for inclusion in the Commercial Fruit Trials at Wisley.

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Other Exhibits.

Mr. E. Johnson, Warley : Strawberries 'Warley' and 'Brightness.'
Messrs. Laxton, Bedford : Apples 'Leader' and 'Rufus'; Plums, 'Black Prince,' 'Warrior,' 'Black Knight.'

The recommendations made by the sub-committee visiting Wisley to judge the trials of Culinary Peas (p. 103) and Kohl-Kabi (p. 101), were confirmed.

FRUIT AND VEGETABLE COMMITTEE, SEPTEMBER 7, 1926.

Mr. J. CHEAL, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Sutton, Reading, for vegetables.

Silver-gilt Hogg Medal.

To Messrs. T. Rivers, Sawbridgeworth, for fruit trees in pots.

To Mr. J. C. Allgrove, Slough, for collection of fruit.

Silver Hogg Medal.

To Messrs. Laxton, Bedford, for Apples and Pears.

Award of Merit.

To Apple 'Exquisite' (vote unanimous), from Messrs. Laxton, Bedford. This new apple is the result of a cross between 'Cellini' and 'Cox's Orange Pippin.' It is moderately large, conical, or sometimes roundish, with slight ribbing on the sides. The skin is a little greasy and on the exposed side is covered with red flush and crimson stripes. The eye is half-open in a medium basin and the stalk about 1 inch long, set in a broad and deep cavity, which is a little russeted. The flesh is white, firm and juicy, and has something of the rich flavour of 'Cox's Orange Pippin.' The fruits ripen just before 'Worcester Pearmain' (September) and after most early varieties are over. The variety is said to be a strong grower and very fertile. This apple was also recommended for inclusion in the Commercial Fruit Trials at Wisley.

Other Exhibits.

Mr. H. Penfold, Warminster : seedling Apple.

Mr. G. Bedford, Bognor : seedling Apple.

Mr. W. Sealey, Maidenhead : seedling Plum.

Mr. T. Waight, Pitsea : seedling Plum.

Sir Wm. Lawrence, Bt., Burford : Cape Gooseberry 'Naples form.'

Messrs. Laxton, Bedford : Plums 'Potentaté,' 'Victor,' 'Royal Gage.'

FRUIT AND VEGETABLE COMMITTEE, SEPTEMBER 21, 1926.

AT HOLLAND PARK.

Mr. A. H. PEARSON, V.M.H., in the Chair, and eleven other members present.

No awards were recommended on this occasion.

Exhibits.

Mr. P. Wright, Maudersley : seedling Apple.

Mr. W. Honeysett, Hadleigh : seedling Apple.

Mr. Chas. Turner, Slough : seedling Grape.

Mr. E. H. Wells, Wellington : Blackberry.

FRUIT AND VEGETABLE COMMITTEE, OCTOBER 5, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and thirteen other members present.

No awards were recommended on this occasion.

Plum 'Lord Lambourne,' sent by Mr. R. Staward, Ware Park Gardens, Ware, Herts, was recommended for inclusion in the Commercial Fruit Trials at Wisley.

Other Exhibits.

Mr. J. J. Kettle, Corfe Mullen : Raspberries.
 Mr. W. G. Roffe, Whitechurch : seedling Apple.
 Mr. G. Trinder, Fleet : Raspberry 'Golden Hornet.'
 Mr. M. Nicholls, Kemsing : seedling Pear.
 Frances Countess of Warwick, Warwick Castle : *Musa Cavendishii*.
 Sir Wm. Lawrence, Bt., Burford : Capsicums.
 Mr. R. Staward, Ware Park Gardens : Peach 'Lord Desborough.'

FRUIT AND VEGETABLE COMMITTEE, OCTOBER 12, 1926.

AUTUMN FRUIT SHOW.

Mr. C. G. A. Nix, V.M.H., in the Chair, and twenty-six other members present.

No awards were recommended on this occasion.

Apple 'Imperial,' sent by Messrs. Laxton, Bedford, was recommended as the most promising seedling Apple which has not previously been exhibited at any of the Society's Meetings. If this recommendation is confirmed in 1927 the apple will be awarded the Bunyard Cup.

Other Exhibits.

Mr. R. Fairman, Crawley : seedling Apple.
 Mr. W. Ogg, Elgin : Apple 'Golden Cox.'
 Messrs. Seaby, Camberley : seedling Pear.
 Messrs. Laxton, Bedford : Apples, 'Triumph,' 'Victor,' 'Epicure'; Pear 'Beurre Bedford'; Plum, 'Laxton's Prune.'
 Mr. P. C. M. Veitch, Exeter : Purple Leaf Peach (*Prunus Amygdalus foliis purpureis*).

FRUIT AND VEGETABLE COMMITTEE, OCTOBER 19, 1926.

Mr. J. CHEAL, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—*Gold Medal.*

To Sir Chas. Nall-Cain, Bt. (gr. Mr. T. Pateman), Hatfield, for collection of fruit.

To Hon. Vicary Gibbs (gr. Mr. E. Beckett), Aldenham, for collection of vegetables.

Silver-gilt Hogg Medal.

To Mr. J. C. Allgrove, Slough, for fruit.

Award of Merit.

To Pear 'Sir Harry Veitch' (votes 9 for, 1 against), from Mr. J. C. Allgrove, Slough. This new pear is the result of a cross between 'Thompsons' and 'Josephine de Malines'; in season in October. The fruit is of medium size, sometimes a little small, conical and almost covered with thin brown russet. The eye is half-open, almost clove-like, and is set in a shallow basin. The stalk is short and woody, set in a narrow cavity. The flesh is melting, juicy and very sweet. The flavour is very good. The variety is said to be moderately vigorous and a free cropper.

Other Exhibits.

Mr. J. J. Kettle, Corfe Mullen : Raspberries.
 Messrs. Dobbie, Edinburgh : vegetables selected for seed.
 The recommendations made by the Sub-Committee visiting Wisley to judge the trials of Maincrop Potatoes (p. 117) and Cabbages were confirmed.

CABBAGES, SPRING SOWN.

GREEN VARIETIES.

Award of Merit.

- 33. 'Cotswold Queen,' sent by Messrs. J. Jefferies.
- 35. 'Wheeler's Imperial' (Warminster stock), sent by Messrs. Cooper, Labor.
- 125. 'Primo,' sent by Messrs. Watkins & Simpson.

Highly Commended.

- 28. 'Nonpareil,' sent by Messrs. J. Carter & Co.
- 68. 'Express,' sent by Messrs. Nutting.
- 97. 'St. John's Day,' sent by Messrs. Dachnfeldt & Jensen.
- 103. 'Midsummer,' sent by Messrs. Pennell.
- 113. 'Pride of the West,' sent by Messrs. J. C. Wheeler.
- 124. 'Primo,' sent by Messrs. W. H. Simpson.
- 148. 'Rosette Colewort,' sent by Messrs. W. H. Simpson.

Commended.

- 42. 'Stanley,' sent by Messrs. Kelway.

RED VARIETIES.

Award of Merit.

- 141. 'Roode Nunhemmer,' sent by Nunhem Zaaizaadvereeniging.
- 145. 'Vesuvius Pickling,' sent by Messrs. Webb.

Highly Commended.

- 146. 'Red Drumhead' (Extra Selected), sent by Messrs. Wheelers (Warminster).
- 147. 'Perfect Red,' sent by Messrs. Barr.

FRUIT AND VEGETABLE COMMITTEE, NOVEMBER 2, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and eight other members present.

Awards Recommended :—

Gold Medal.

To Messrs. Dobbie, Edinburgh, for Potatos.

Silver-gilt Knightian Medal.

To Messrs. Carter, Raynes Park, for Potatos.

Other Exhibits.

Mr. R. Fairman, Crawley : seedling Apple.
 Messrs. Geo. Bunyard, Maidstone : Apples.
 Messrs. Laxton, Bedford : Apples.
 Mr. P. D. Williams, St. Keverne : Apple 'Penhallow.'

FRUIT AND VEGETABLE COMMITTEE, NOVEMBER 16, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and thirteen other members present.

Award Recommended :—

Hogg Medal.

To Mr. H. Hemsley, Crawley, for Apples and Pears.

Other Exhibits.

Messrs. Geo. Bunyard, Maidstone : Pears.
 Mr. F. J. Winton, Whittleford : Strawberry 'Borain.'

FRUIT AND VEGETABLE COMMITTEE, NOVEMBER 30, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and fourteen other members present.

No awards were recommended on this occasion.

Exhibits.

Mr. H. Hemsley, Crawley : Apples and Pears.

Messrs. Barr, Covent Garden : Kales.

Mr. Chas. Turner, Slough : Apple 'Arthur Turner.'

Mrs. Miller, Marlow : preserves.

FRUIT AND VEGETABLE COMMITTEE, DECEMBER 14, 1926.

Mr. C. G. A. NIX, V.M.H., in the Chair, and ten other members present.

No awards were recommended on this occasion.

Exhibits.

Hon. Vicary Gibbs, Aldenham : Brussels Sprout 'Filbert.'

Mrs. Miller, Marlow : preserves.

Mrs. Wintour, Loose : preserves.

Mrs. Fleming, Uxbridge : preserves.

Miss H. G. Sewell, S. Kensington : preserves.

The recommendations made by the Sub-Committee visiting Wisley to judge the trials of Garden Swedes (p. 284), Celeriac (p. 287) were confirmed.

Highly Commended, after trial at Wisley, Jerusalem Artichoke 'Fuseau.' The tubers, which are produced very freely, are some four or five inches long and nearly an inch in diameter. They are white, with a faint pinkish tinge, and when cooked are superior in flavour to those of the common purple variety.

FLORAL COMMITTEE.

JULY 13, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

- To Messrs. Allwood, Haywards Heath, for Carnations.
- To Messrs. A. Dickson, Newtownards, for Roses.
- To Messrs. Dobbie, Edinburgh, for Sweet Peas.

Silver Banksian Medal.

- To Messrs. Chaplin, Waltham Cross, for Roses.
- To Mr. H. J. Jones, Lewisham, for Hydrangeas.
- To Messrs. Ladhams, Southampton, for herbaceous plants.
- To Mr. R. C. Notcutt, Woodbridge, for herbaceous plants.
- To Messrs. Prichard, Christchurch, for herbaceous plants.
- To Messrs. Waterer, Sons & Crisp, Twyford, for herbaceous plants.

Banksian Medal.

- To Mr. W. E. B. Archer, Ashford, for Roses.
- To Messrs. Engelmann, Saffron Walden, for Carnations.
- To Mr. C. H. Herbert, Birmingham, for Pinks.
- To Mr. J. H. Pemberton, Havering, for Roses.
- To Mr. G. Reuthe, Keston, for herbaceous plants.
- To Messrs. Rogers, Southampton, for *Iris Kaempferi*, etc.
- To Mr. Yandell, Maidenhead, for Violas.

Award of Merit.

To Campanula 'Donald Thurston' (votes 15 for), from Mr. F. L. Thurston, Broadway. A seedling from 'C. 'Telham Beauty' with very large pale-blue flowers.

To Carnation 'Earl Beatty' (votes 14 for, 3 against), from Mr. W. E. McCracken, Long Eaton. An excellent crimson border variety of strong sturdy habit. The flowers are of good size with non-bursting calyces and a very strong clove scent. The plants are very free flowering and owing to their strong growth require practically no staking.

To Delphinium 'Orion' (votes unanimous), from Messrs. Baker, Thompson & Morgan, Egmond, and Ruys. A variety growing in the trials at Wisley. It was recommended for this higher award when inspected by the Sub-Committee on July 1. For description see vol. 51, p. 125.

To Hemerocallis 'Margaret Perry' (votes unanimous), from Mr. A. Perry, Enfield. This very pleasing deep orange variety with streaks of a paler shade is the result of a cross between *H. fulva* and *H. cypriana*.

To Rose 'Frank Reader' (votes 14 for, 4 against), from Messrs. Prior, Colchester. A large cream hybrid Tea variety with a pleasing scent. The plant is a strong grower and very free flowering over a long season.

To Rose 'Jack Hobbs' (votes 15 for), from Messrs. Prior, Colchester. A good deep carmine Polyantha bedding Rose resulting from a cross between 'Alice Amos' (dwarf Polyantha) and a seedling from 'Independence Day' crossed with 'General Jacqueminot.' It flowers very freely from June to November.

The awards recommended to Linums and Nemophilas on trial at Wisley were confirmed (pp. 278, 279).

Other Exhibits.

- Messrs. Allen, Norwich : Gaillardia 'Tangerine.'
- L. Brydon, Esq., Innerleithen : Delphinium 'Adam Brydon.'
- Messrs. F. Cant, Colchester : Roses.
- Mr. T. Carlile, Twyford : Delphinium 'Lady of Loddon.'
- A. J. Cobb, Esq., Reading : Phlox 'The Dean.'

Messrs. Cutbush, Barnet : Carnations.
 H. A. Hare, Esq., Much Hadham : Phlox 'Snowdon.'
 Messrs. Hewitt, Solihull : Delphinium 'Monarch of Wales.'
 Misses Hopkins, Shepperton : herbaceous plants.
 Messrs. Laxton, Bedford : Roses.
 Messrs. Sutton, Reading : *Achimenes* 'Monarch'; *A.* 'Pink Beauty'; *Dimorphotheca* 'Sutton's Yellow Prince,' 'Sutton's Sunrise'; *Nemesis* 'Hydrangea.'
 Mrs. Wilson, London : Pansies.

Section B.

Mr. G. W. E. LODER in the Chair, and thirteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Mr. A. Perry, Enfield, for water lilies and waterside plants.

Silver Banksian Medal.

To Messrs. Russell, Richmond, for shrubs and alpiners.

Banksian Medal.

To Messrs. Tucker, Oxford, for alpiners.

To Mr. F. G. Wood, Ashted, for alpiners and shrubs.

Award of Merit.

To *Abelia Schumannii* (votes 7 for, 1 against), from J. Preston, Esq. (gr. Mr. Wood), Hayes. A hardy Chinese shrub with large rosy-lilac flowers borne at the ends of long arching shoots. The leaves are ovate and opposite.

To *Deutzia taiwanensis* (votes unanimous), from G. W. E. Loder, Esq., Ardingly. A very free flowering distinct shrub with long racemes of white flowers. The calyces are purplish and the stamens are bright yellow. The opposite lanceolate leaves are sage-green in colour.

To *Heeria elegans* (votes unanimous), from J. Preston, Esq. (gr. Mr. Wood), Hayes. A tender plant of prostrate habit suitable for alpine house cultivation. It bears its rose-coloured flowers with great freedom. The small opposite entire leaves are pinnately nerved.

To *Nymphaea amabilis* (votes unanimous), from Lionel de Rothschild, Esq., Exbury. A beautiful rich pink water lily of large size raised by Latour Marliac. It opens a pleasing salmon shade and deepens with age.

To *Nymphaea* 'Attraction' (votes unanimous), from Lionel de Rothschild, Esq., Exbury. A large bright and attractive deep purplish-crimson variety with lighter venations. It is of French origin, having been raised by Latour Marliac.

To *Tritoma hyalina* (votes unanimous), from E. A. Bowles, Esq., Waltham Cross. A beautiful plant belonging to the Iridaceae from the S.W. provinces of the Cape. Its pale orange flowers are borne in lax spikes.

Preliminary Recognition.

To *Mutisia retusa* var. *glaberrima*, from Sir Wm. Lawrence, Bt., Dorking. A rose-pink species from the Argentine Andes.

To *Salvia Bellejana*, from Mr. A. Perry, Enfield. A shrubby yellow species with a maroon lip.

Other Exhibit.

Lady Aberconway and Hon. H. D. McLaren, Bodnant : three *Watsonia* spp. from S. Africa.

FLORAL COMMITTEE, JULY 27, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and eleven other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Hon. Vicary Gibbs, Elstree, for scented Pelargoniums.

Silver Banksian Medal.

- To Messrs. Allwood, Haywards Heath, for Carnations.
- To Messrs. Daniels, Norwich, for annuals.
- To Mr. H. Hemsley, Crawley, for Sidalceas.
- To Mr. H. J. Jones, Lewisham, for Phloxes.
- To Messrs. Kelway, Langport, for Gladioli.
- To Messrs. Ladhams, Southampton, for herbaceous plants.
- To Messrs. Prior, Colchester, for Roses.

Banksian Medal.

- To Chalk Hill Nurseries, Reading, for herbaceous plants.
- To Messrs. Engelmann, Saffron Walden, for Carnations.
- To Messrs. Hewitt, Solihull, for Phloxes and Gladioli.
- To Messrs. House, Westbury-on-Trym, for Scabious.
- To Messrs. Low, Bush Hill Park, for Carnations.
- To Mr. F. G. Wood, Ashted, for herbaceous plants.

Award of Merit.

To Phlox 'Royal Purple' (votes unanimous), from Hon. Vicary Gibbs (gr. Mr. E. Beckett), Elstree. A good rosy-purple variety raised in the gardens of Aldenham House.

To *Scabiosa anthemifolia rosea* 'Thomas Hay's variety' (votes unanimous), from Messrs. House, Westbury-on-Trym. An exceptionally vigorous form of this useful South African plant. The flowers are large and of a pleasing rosy-lilac colour. The flowering period lasts about six months, so that the plant is very valuable for cutting or market work.

Other Exhibits.

- Mr. T. Hancock, Mansfield : Rose 'Charming Princess.'
- Misses Hopkins, Shepperton : herbaceous plants.
- Lt.-Col. Messel, O.B.E., Handcross : Verbena 'Foxhunter.'
- A. G. Russell, Esq., Southwater : Achillea seedlings.
- H. Walter, Esq., Leatherhead : P. F. Carnation 'Miss Joan Walter.'

Section B.

Mr. G. W. E. LODER in the Chair, and twelve other members present.

Awards Recommended :—

Silver-gilt Lindley Medal.

- To Mr. A. Perry, Enfield, for aquatics.

Silver Banksian Medal.

- To Messrs. Prichard, Christchurch, for alpine.
- To Mr. G. Reuthe, Keston, for herbaceous plants, shrubs and alpine.
- To Messrs. Russell, Richmond, for shrubs and alpine.
- To Messrs. R. Veitch, Exeter, for shrubs.

Banksian Medal.

- To Messrs. Tucker, Oxford, for alpine.

Award of Merit.

To *Allium sphaerocephalum descendens* (votes 8, 1 against), from Mr. R. C. Notcutt, Woodbridge. A pretty hardy species with very rigid compact heads of old rose flowers.

To *Ceanothus* 'Henri Desfossé' (votes unanimous), from Messrs. R. Veitch, Exeter. A hardy flowering shrub of French origin. Its deep blue flowers are borne in great profusion and the plant appears to be a vigorous grower.

To *Crinum amabile* (votes 7 for, 3 against), from Major Albert Pam, Broxbourne. This plant comes from Peru, and although showing affinity to *C. erubescens* it is not that species. It has very large long leaves and the segments of the flower are white streaked with deep rose.

To *Escallonia* × *Iveyi* (votes unanimous), from Messrs. R. Veitch, Exeter. A supposed hybrid between *E. montevidensis* and *E. exoniensis*. It is very free flowering in habit. The flowers are white tinted with pink at the base of the tube. The leaves are dark green, serrated and glossy.

To *Phygelius capensis coccineus* (votes 6 for, 2 against), from Messrs. C. Elliott, Stevenage. A very vigorous and specially fine colour form of this South African plant. It bears long growths well furnished with rich red flowers.

Other Exhibits.

Rev. K. A. Lake, Heavitree : *Campanula* 'Lake's hybrid.'
 Sir Wm. Lawrence, Bt., Dorking : *Calochortus macrocarpus*, F.C.C. 1883,
C. Plummerae, F.C.C. 1894.
 Royal Botanic Gardens, Kew : *Lonicera Hildebrandtiana*.
 Messrs. Sutton, Reading : *Achimenes Harveyi*.
 Mr. W. H. Walters, Colesborne : *Veronica salicifolia*, Wilson's form.

FLORAL COMMITTEE, AUGUST 10, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Bath, Wisbech, for Gladioli.
 To Mr. H. J. Jones, Lewisham, for Phloxes.
 To Messrs. Kelway, Langport, for Gladioli.

Silver Banksian Medal.

To Messrs. Ladhams, Southampton, for herbaceous plants.
 To Messrs. Langridge, Westerham, for Gladioli.
 To Mr. J. H. Pemberton, Havering, for Roses.
 To Messrs. Prichard, Christchurch, for herbaceous plants.
 To Messrs. Prior, Colchester, for Roses.

Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.
 To Messrs. F. Cant, Colchester, for Roses.
 To Messrs. Cheal, Crawley, for Dahlias.
 To Mr. A. Edwards, Fordham, for Gladioli.
 To Messrs. Engelmann, Saffron Walden, for Carnations.
 To Mr. Hemsley, Crawley, for *Sidalceas* and Dahlias.
 To Mr. Yandell, Maidenhead, for Violas.

Award of Merit.

To *Achimenes* 'Dwarf Pink' (votes unanimous), from Messrs. Sutton, Reading. A useful deep carmine-pink variety of compact habit.

To *Gladiolus* 'Kelway's Defiance' (votes 10 for, 2 against), from Messrs. Kelway, Langport. A good scarlet variety of the Kelwayi section with a cream streak and some spotting on the lower middle petal.

To Phlox 'Enchantment' (votes unanimous), from Hon. Vicary Gibbs, Elstree. A pale pink variety with a well-defined deep rose eye.

To Phlox 'Hon. Mildred Gibbs' (votes unanimous), from Hon. Vicary Gibbs, Elstree. A large rosy violet-purple Phlox with a white eye.

To Phlox 'Mrs. Edwin Beckett' (votes 10 for, 3 against), from Hon. Vicary Gibbs, Elstree. A large pale lilac variety with a deep rose zone round the eye.

To Phlox 'Vicary's Victory' (votes 10 for), from Hon. Vicary Gibbs, Elstree. A bright deep pink variety with a lighter eye.

The awards recommended to *Cosmeas*, *Lavateras*, *Nemesias* and *Viscarias* on trial at Wisley were confirmed (p. 269).

The following Dahlia was selected by the Joint Dahlia Committee for trial at Wisley :—

From Messrs. Cheal, Crawley :
 'Capel Star' (Star).

Other Exhibits.

W. Briggs, Esq., Welling : Violas.
 F. Burton, Esq., Hildenborough : *Lobelia* 'Mauve Star.'
 Mr. T. Hancock, Mansfield : *Rose* 'Charming Princess.'

Mrs. E. J. R. Owen, Pwllheli : *Chrysanthemum maximum* 'Erw Wen.'
 Messrs. Stark, Fakenham : *Sidalcea* 'Beauty.'
 Mrs. Vigers, Southend-on-Sea : Hollyhocks.
 H. W. Warner, Esq., Henfield : *Coleus* 'Beauty of Kentwyns.'
 Mr. W. Wells, Jun., Merstham : *Mimulus* 'Whitcroft Scarlet.'

Section B.

Mr. G. W. E. LODER in the Chair, and ten other members present.

Awards Recommended :—

Silver Banksian Medal.

To Mr. A. Perry, Enfield, for aquatics and herbaceous plants.

To Mr. G. Reuthe, Keston, for shrubs and herbaceous plants.

Award of Merit.

To *Cupressus tamaricifolia* 'Tilgate variety' (votes 4 for, 1 against), from Mr. Hemsley, Crawley. A very neat dwarf form with pale green foliage.

To *Satyrion coriifolium* (votes unanimous), from Mr. A. Perry, Enfield. An African terrestrial orchid bearing a spike of deep orange hooded flowers.

To *Sphaeralcea Fendleri* 'Hascombe Orange' (votes unanimous), from C. T. Musgrave, Esq., Hascombe. An interesting and very pretty hardy shrubby plant bearing bright orange flowers. It resulted from a cross between *Sphaeralcea Fendleri* and a *S. convolvulacea* seedling.

Other Exhibit.

Misses Hopkins, Shepperton : rock garden.

FLORAL COMMITTEE, AUGUST 24, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. R. H. Bath, Wisbech, for Gladioli.

To Messrs. Hewitt, Solihull, for Gladioli.

To Messrs. Kelway, Langport, for Gladioli.

Silver Banksian Medal.

To Messrs. Allen, Norwich, for Roses.

To Messrs. Chaplin, Waltham Cross, for Roses.

To Messrs. Cheal, Crawley, for Dahlias.

To Messrs. House, Westbury-on-Trym, for Scabious.

To the Orpington Nurseries, Orpington, for Gladioli.

To Mr. J. H. Pemberton, Havering, for Roses.

To Mr. G. G. Whitelegg, Chislehurst, for Gladioli, etc.

Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Cheal, Crawley, for Phloxes.

To Messrs. Dobbie, Edinburgh, for Gladioli.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Mr. Hemsley, Crawley, for Dahlias and Sidalceas.

Award of Merit.

To Montbretia 'E. A. Bowles' (votes unanimous), from Hon. Mrs. Montagu (gr. Mr. J. E. Fitt), Attleborough. This is one of the famous 'Earlham' varieties raised by the late Sydney Morris, Esq. It is the result of a cross between Montbretia 'Sunshine' and an unnamed seedling. Its colour is a lovely shade of rose-cardinal with a pale crimson zone and a yellow throat.

To Montbretia 'Lord Lambourne' (votes unanimous), from Hon. Mrs. Montagu (gr. Mr. J. E. Fitt), Attleborough. Another of the 'Earlham' seedlings resulting from a cross between the varieties 'Queen Charlotte' and 'Pocahontas.' Its handsome flowers are very large, orange-scarlet in colour, and have irregular patches of dark crimson at the base of the segments and orange-yellow throats.

To Phlox 'Lord Lambourne' (votes unanimous), from Hon. Vicary Gibbs (gr. Mr. E. Beckett), Elstree. A delightful bright pink variety with a white eye.

To Phlox 'Mauve Queen' (votes 8 for, 4 against), from Hon. Vicary Gibbs (gr. Mr. E. Beckett), Elstree. A large rosy-mauve variety with a white eye.

The awards recommended to Portulacas, Helichrysums and Statics on trial at Wisley were confirmed (p. 269).

The following Dahlias were selected by the Joint Dahlia Committee for trial at Wisley:—

From Messrs. Cheal, Crawley:

'Burford Star' (Star), 'Cheerful' (Camellia).

From Messrs. Stredwick, St. Leonards-on-Sea:

'Daily Mirror' (Dec.), 'Hyde Park Beauty' (Dec.), 'Manniquin' (Cactus), 'Mary Segar' (Cactus), 'Rosa Taylor' (Dec.), 'Thos. Hay, V.M.H.' (Dec.), 'Thos. Want' (Cactus), 'Trophy' (Cactus), 'W. D. Cartwright' (Dec.).

Other Exhibits.

Lady Aberconway and Hon. H. D. McLaren, Bodnant: Kniphofia 'Hyale.'

Messrs. Carter, Raynes Park: Pentstemon 'Carmine Queen.'

Misses Hopkins, Shepperton: herbaceous plants.

Mr. W. T. A. Roots, Cranford: Chrysanthemum 'The Ashes.'

Mrs. H. A. Lloyd Thomas, Compton Beauchamp: Carnations.

Mr. H. Trim, Treforest: Chrysanthemum 'Zillah Aston.'

Yokohama Nursery Co., London: *Lilium auratum platyphyllum rubro-vittatum*, F.C.C. 1885.

Section B.

Mr. C. T. MUSGRAVE in the Chair, and nine other members present.

Awards Recommended:—

Banksian Medal.

To Mr. G. Reuthe, Keston, for alpiners, shrubs and herbaceous plants.

To Messrs. L. R. Russell, Richmond, for Clematis, etc.

To Mr. F. G. Wood, Ashted, for alpiners, shrubs and herbaceous plants.

First-class Certificate.

To *Eucryphia* × 'Nymansey' (votes unanimous), from Lt.-Col. Messel, O.B.E. (gr. Mr. J. Comber), Handcross. This handsome shrub or small tree received an Award of Merit on August 26, 1924. It is a natural hybrid between *E. pinnatifolia* and *E. cordifolia* and is of very free and somewhat fastigiate growth. It has very large white flowers 3½ inches wide, with broad ovate petals. Its leaves are compound, lanceolate, serrated and shiny. In the present season it proved to be very free flowering and is apparently as hardy as *E. pinnatifolia* and much hardier than *E. cordifolia*.

Award of Merit.

To *Anarrhinum bellidifolium* (votes unanimous), from T. Hay, Esq., V.M.H., Hyde Park, W. A biennial plant from Southern Europe. It grows 2 ft. high and bears its small pale lavender-blue flowers in elongated graceful spike-like racemes. Its radical leaves are spatulate or obovate-lanceolate in shape and deeply toothed.

Other Exhibits.

Sir William Lawrence Bt., Dorking: *Grindelia speciosa* from the Argentine Andes.

Mrs. Longstaff, Sevenoaks: *Sedum fastigiatum*.

C PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

FLORAL COMMITTEE, SEPTEMBER 7, 1926.

Section A.

Mr. J. F. McLEOD in the Chair, and fourteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Mr. H. J. Jones, Lewisham, for Phloxes.

To Messrs. Kelway, Langport, for Gladioli.

Silver Banksian Medal.

To Mrs. Barr, Taplow, for Montbretias.

To Messrs. Dobbie, Edinburgh, for Asters, Pansies and Violas.

To Mr. Edwards, Fordham, for Gladioli.

To the Orpington Nurseries, Orpington, for Gladioli.

Banksian Medal.

To Messrs. Lowe & Gibson, Crawley Down, for Gladioli.

To Messrs. House, Westbury-on-Trym, for herbaceous plants.

Other Exhibits.

Messrs. Cuthbert, Southgate : *Streptocarpus*.

Mr. Hemsley, Crawley : *Solidago* 'Kingsley's Dwarf.'

Misses Hopkins, Shepperton : herbaceous plants.

Section B.

Mr. G. W. E. LODER in the Chair, and ten other members present.

No awards were recommended on this occasion.

Exhibit.

Messrs. Lane, Berkhamsted : *Cupressus Lawsoniana Lanei*.

JOINT DAHLIA COMMITTEE, SEPTEMBER 8, 1926.

The Dahlia Show.

The following Dahlias were selected by the Joint Dahlia Committee for trial at Wisley :—

From Messrs. Ballego, Leiden, Holland :

'Giant Kriemhilde' (Cactus), 'Negro' (Dec.), 'Rapallo' (Dec.).

From Messrs. Bruidegom, Baarn, Holland :

'Purperkoning' (Dec.).

From Messrs. Burrell, Cambridge :

'Citron' (Charm), 'Falcon' (Charm), 'Ruth' (Charm), 'Vedas' (Charm), 'Zillah' (Charm).

From Messrs. Carlée, Heemstede, Holland :

'Locarno' (Dec.).

From Messrs. Cheal, Crawley :

'Epsom Star' (Star), 'Lady Madden' (Min. Pæony), 'Lustre' (Mignon), 'Mrs. D. Hepburn' (Dec.), 'Mrs. D. Luscombe' (Dec.), 'Mrs. Goddard' (Min. Pæony), 'Murren' (Pom.).

From Messrs. Hornsveld, Baarn, Holland :

'Rose Tendre' (Dec.).

From Messrs. Jarman, Chard :

'Coronach' (Pæony), 'Falstaff' (Pæony), 'Nigger' (Pom.).

From Messrs. Kroon, Baarn, Holland :

'Freedom' (Dec.), 'Wealthy' (Dec.).

From Messrs. Majoor, Baarn, Holland :

'Betsy Majoor' (Dec.).

- From Mr. H. Shoesmith, Jun., Woking :
 ' Peach Blossom ' (Cactus), ' Royal Purple ' (Cactus).
 From Messrs. Stredwick, St. Leonards-on-Sea :
 ' Alan Cobham ' (Dec.), ' Goldmine ' (Dec.), ' J. L. Crowther ' (Dec.).
 From Mr. C. Turner, Slough :
 ' Aida ' (Min. Pæony).
 From Messrs. van Bourgondien, Hillegom, Holland :
 ' Earle Williams ' (Dec.), ' Mrs. Crowley ' (Dec.).
 From Messrs. van der Kloof, Leiden, Holland :
 ' Clown ' (Dec.).

FLORAL COMMITTEE, SEPTEMBER 21, 1926.

Section A.

At Holland Park Skating Rink.

Mr. H. B. MAY, V.M.H., in the Chair, and seventeen other members present.

Awards Recommended :—

Award of Merit.

To Aster ' Ruby Tips ' (votes unanimous), from Mr. E. Ballard, Colwall. A distinct, aptly named rosy-lilac variety of rigid habit, useful for cutting or for the border. It was raised by the exhibitor and belongs to the Novi-Belgii section.

To Chrysanthemum ' Janet Wyber ' (votes 14 for), from Mr. A. W. Thorpe, Lichfield. A good pale primrose early-flowering variety.

To Chrysanthemum ' Madeline ' (votes unanimous), from Mr. A. W. Thorpe, Lichfield. A useful yellow early-flowering variety.

To Chrysanthemum ' Peerless ' (votes 9 for, 4 against), from Mr. A. W. Thorpe, Lichfield. A bright yellow single variety with several rows of florets. It produces very good sprays.

To *Solidago* × *Ballardii* (votes unanimous), from Mr. E. Ballard, Colwall. A very distinct hardy herbaceous plant resulting from a cross between our native *Solidago Virgaurea* and *S. canadensis* ' Golden Wings.' It is of graceful habit and about 3 feet high. The colour of the flowers is golden-yellow.

The awards recommended to Dahlias on trial at Wisley were confirmed (p. 88).

The following Dahlias were selected by the Joint Committee for trial at Wisley :—

- From Messrs. Burrell, Cambridge :
 ' Hettie ' (Charm), ' Irma ' (Charm), ' Maggie ' (Charm), ' Tibothe ' (Charm).
 From Mr. H. Shoesmith, Jun., Woking :
 ' Charm ' (Cactus).
 From Messrs. Stredwick, St. Leonards-on-Sea :
 ' Arthur J. Cobb ' (Dec.).

Other Exhibits.

- Messrs. Allwood, Haywards Heath : P. F. Carnation ' Cottage Maid.'
 Messrs. Barr, Taplow : Aster ' Barr's Pink,' A.M. 1920.
 Messrs. Brunning, Great Yarmouth : Dahlia ' Willie Batchelor.'
 Messrs. Cheal, Crawley : Dahlias.
 Mr. A. J. Cobb, Reading : Dahlias.
 Messrs. Fairbairn, Carlisle : Phlox ' Border Gem.'
 Messrs. Forbes, Hawick : Dahlia ' Muriel Lawrie.'
 Messrs. Gibson, Bedale : Chrysanthemum ' The Duchess.'
 Mr. T. Hancock, Mansfield : Rose ' Charming Princess,' *Kentia Balmoreana*.
 Mr. J. L. Holbrook, Chingford : Gladiolus ' My Beauty.'
 Mr. H. Shoesmith, Jun., Woking : Chrysanthemums.
 Messrs. Simmonds, King's Langley : Helenium ' Chipperfield Beauty,'
 Chrysanthemum ' Chipperfield Sunshine.'
 Messrs. Treseder, Cardiff : Dahlias.
 Messrs. Wheatcroft, Gedling : Roses.
 Mr. H. Woolman, Birmingham : Chrysanthemums.

Section B.

Mr. G. W. E. LODER in the Chair, and fifteen other members present.

Awards Recommended :—

First-class Certificate.

To *Crinodonna* × *Memorii-Corsii* (votes unanimous), from Mr. F. Howard, Los Angeles, California. An interesting bigeneric hybrid between *Amaryllis Belladonna* and *Crinum Powellii*. The growth and dark green leaves are like those of the Crinum. The flowers show the influence of the *Amaryllis*, and are pale blush rose in colour, becoming rather deeper at the tips.

Award of Merit.

To *Berberis Thunbergii atropurpurea* (votes 5 for), from Mr. A. Perry, Enfield. A variety of *B. Thunbergii* with rich dark red tinted foliage.

To *Clerodendron foetidum* (votes 7 for), from G. W. E. Loder, Esq., Ardingly. A tender Chinese shrub bearing dense heads of rosy-pink flowers having prominent stamens on long white filaments. The dark green ovate leaves are large and irregularly crenated. When crushed they emit an unpleasant odour. The flowers are fragrant.

To *Salvia coerulca* (votes 8 for), from Mrs. P. Martineau, Ascot. The deep violet-blue flowers are borne in long spikes. The subcordate dark green leaves are deeply veined and the margins are crenated.

To *Phyllitis Scolopendrium sagittato-crispum cristatum*, Perry's variety (votes 7 for), from Mr. A. Perry, Enfield. A very compact, dwarf cristate and frilled form of the Hart's Tongue Fern.

Other Exhibits.

Col. Stephenson Clarke, Cuckfield : *Ceratostigma Polhillii*.

Messrs. C. Elliott, Stevenage : *Caryopteris tangutica*.

North Park Nurseries, Three Bridges : *Ligustrum japonicum* × common Evergreen Privet.

Mr. R. C. Notcutt, Woodbridge : *Hunnemannia fumariaefolia*.

Mr. A. Perry, Enfield : *Biarum eximium*, recommended for Botanical Certificate.

Messrs. Russell, Richmond : *Aphelandra tetragona*.

Mr. S. Smith, Enfield : Cotyledon 'Smith's Seedling.'

FLORAL COMMITTEE, OCTOBER 5, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Mr. H. J. Jones, Lewisham, for Asters.

Silver Banksian Medal.

To Mr. E. Ballard, Colwall, for Asters.

To Messrs. Cheal, Crawley, for Dahlias.

To Messrs. Easlea, Leigh-on-Sea, for Roses.

To Messrs. House, Westbury-on-Trym, for Scabious, etc.

To Messrs. Luxford, Harlow, for Chrysanthemums.

To Mr. J. H. Pemberton, Havering, for Roses.

To Mr. J. B. Riding, Chingford, for Dahlias.

To Mr. W. M. Sydenham, Melbourne, Derby, for Asters and Chrysanthemums.

To Mr. C. Turner, Slough, for Dahlias.

To Messrs. Waterer, Sons & Crisp, Twyford, for Asters.

To Mr. W. Wells, Jun., Merstham, for Asters.

To Mr. J. T. West, Brentwood, for Dahlias.

To Mr. A. G. Vinten, Balcombe, for Chrysanthemums.

Banksian Medal.

- To Messrs. Allwood, Haywards Heath, for Carnations.
 To Messrs. Baker, Wolverhampton, for Asters and other herbaceous plants.
 To Messrs. Barr, Taplow, for Asters and Montbretias.
 To Messrs. Engelmann, Saffron Walden, for Carnations.
 To Messrs. Hewitt, Solihull, for Asters and Delphiniums.
 To Messrs. Jarman, Chard, for Dahlias.
 To Mr. W. Yandell, Maidenhead, for Chrysanthemums.

Award of Merit.

To Aster 'Mrs. George Monro' (votes unanimous), from Mr. E. Ballard, Colwall. An excellent large white variety of very free flowering habit. On opening the flowers are fully double, but later a large pale yellow disc is disclosed and a very slight pale lilac tinge fades with age.

To Canna 'Ensign' (votes unanimous), from Hon. Vicary Gibbs (gr. Mr. E. Beckett), Elstree. A large scarlet variety with dark foliage.

The following Dahlias were selected by the Joint Committee for trial at Wisley:—

- From Messrs. Burrell, Cambridge :
 'Alice' (Charm), 'Dot' (Charm), 'Effie' (Charm), 'Elatior' (Charm),
 'Emmeline' (Charm), 'Wanda' (Charm).
 From Messrs. Cheal, Crawley :
 'Brighton Gem' (Min. Pæony), 'Coulsdon' (Dec.).
 From W. H. Johns, Esq., Bermondsey :
 'Seedling No. 1' (Mignon).
 From Messrs. Stredwick, St. Leonards-on-Sea :
 'Josephine Adair' (Dec.), 'Rev. Herbert Lee' (Dec.).
 From Mr. C. Turner, Slough :
 'Cora' (Min. Pæony).

Other Exhibits.

- Mr. T. Carlile, Twyford : herbaceous plants.
 Mr. G. J. Cooke, Chesfield : Salvia 'Chesfield Salmon.'
 Mr. J. W. Driver, Lindfield : Chrysanthemum 'Lindfield Gold.'
 Misses Hopkins, Shepperton : herbaceous plants.
 Messrs. Hutt, Swanley : Chrysanthemums.
 Mr. J. J. Kettle, Corfe Mullen : Violets.
 Mr. C. T. Kipping, Althorne : Chrysanthemum 'Penthesilie.'
 Mr. B. Pinney, Shipbourne : Violets.
 Messrs. Rich, Bath : Asters and Dahlias.
 Messrs. Skelton & Kirby, Pirbright : herbaceous plants.
 Mrs. A. Tisdell, Woodford Green : Aster 'Ariel.'
 Mr. F. G. Wood, Ashted : Asters, etc.
 Mr. H. Woolman, Birmingham : Chrysanthemums.
 Mr. G. Yeld, Gerrards Cross : Aster 'Orleton.'

Section B.

Mr. G. W. E. LODER in the Chair, and eighteen other members present.

*Awards Recommended:—**Silver-gilt Banksian Medal.*

- To Messrs. Cheal, Crawley, for shrubs.
 To Mr. A. Perry, Enfield, for Lilies and herbaceous plants.

Banksian Medal.

- To Mr. Klinkert, Richmond, for clipped Box and Yew trees.
 To Messrs. Russell, Richmond, for Ivies.

Award of Merit.

To *Gentiana detonsa* (votes 6 for), from Lady Aberconway and Hon. H. D. McLaren, Bodnant. A hardy Gentian from the European Alps. It grows about 1 foot high and has linear lanceolate acute leaves and deep blue flowers three inches long with the segments deeply fringed at the sides.

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To *Ilex Fargesii* (votes unanimous), from H. Armytage Moore, Esq., Saintfield, Co. Down. A small evergreen tree from Western China with very narrow dull green leaves and red berries borne in bunches of about six in the leaf-axils.

Other Exhibits.

University Botanic Gardens, Cambridge: *Cornus Mas* and *Dracocephalum Forrestii*.

FLORAL COMMITTEE, OCTOBER 19, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Mr. J. W. Forsyth, Putteridge, for Chrysanthemums.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Messrs. Blackmore & Langdon, Bath, for Begonias.

To Messrs. Cheal, Crawley, for Dahlias.

To Messrs. House, Westbury-on-Trym, for Scabious.

To Messrs. S. Low, Enfield, for Carnations.

To Messrs. Luxford, Harlow, for Chrysanthemums.

To Mr. J. H. Pemberton, Havering, for Roses.

To Mr. J. B. Riding, Chingford, for Dahlias.

To Messrs. Russell, Richmond, for stove plants.

To Mr. A. G. Vinten, Balcombe, for Chrysanthemums.

To the Duchess of Wellington, Basingstoke, for Nerines, etc.

Banksian Medal.

To Messrs. Baker, Codsall, for herbaceous plants.

To Messrs. Barham & Wood, Edmonton, for Chrysanthemums.

To Messrs. Engelmann, Saffron Walden, for Carnations.

To Messrs. Hewitt, Solihull, for Chrysanthemums.

To Messrs. Ladhams, Southampton, for herbaceous plants.

To Mr. W. Wells, Jun., Merstham, for Asters, etc.

To Mr. Yandell, Maidenhead, for Chrysanthemums.

Award of Merit.

To Carnation 'Ruby Glow' (votes unanimous), from Messrs. S. Low, Enfield. A perpetual-flowering variety raised by the exhibitors. Its glowing crimson flowers are sweetly scented and of excellent form.

To Chrysanthemum 'Alba' (votes 13 for), from Messrs. Luxford, Harlow. An incurved Decorative variety of French origin. The flowers are white and of medium size.

To Chrysanthemum 'Atalanta' (votes 14 for), from Messrs. Cragg, Harrison & Cragg, Heston. A very useful rose-pink Decorative variety.

Other Exhibits.

Mr. G. Carpenter, Byfleet: Chrysanthemum 'Miss M. Hansford.'

Misses Hopkins, Shepperton: hardy plants.

Mr. J. J. Kettle, Corfe Mullen: Violets.

Mr. B. Pinney, Shipbourne: Violets.

Messrs. Pritchard, Christchurch: herbaceous plants.

Messrs. Reamsbottom, West Drayton: Anemones.

Messrs. Rich, Bath: Dahlias.

Mr. T. Thorpe, Tonbridge: *Salvia* 'Dene Park Seedling.'

Section B.

Mr. G. W. E. LODGE in the Chair, and fourteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Shearns, London, for miniature garden.

Banksian Medal.

To Mr. F. G. Wood, Ashted, for rock garden.

Award of Merit.

To *Arbutus Menziesii* (votes 12 for), from the Royal Botanic Gardens, Kew. This well-known beautiful tree belonging to the Ericaceae was on this occasion shown in fruit. The fruits, which are about the size of a pea, are reddish-orange in colour and are produced very freely. The leaves are oval in shape, stalked, dark glossy green above and glaucous beneath. The white pitcher-shaped flowers are produced in May in terminal pyramidal panicles. A native of California.

To *Chirita Marcarii* (votes 11 for), from the Royal Botanic Gardens, Kew. An interesting stove plant from Siam. It belongs to the Gesneraceae and has dark green broad ovate pubescent leaves. The bright orange flowers are borne mostly in pairs, sometimes in threes, at the junction of the leaf stalk with the blade.

To *Kniphofia multiflora* (votes 11 for, 3 against), from Messrs. Prichard, Christchurch. A perfectly hardy species from Natal. The leaves are long and deeply channelled, bright green above and somewhat glaucous beneath. The flowers are sulphury-white with bright golden stamens and are borne in a long dense bold spike.

To *Polystichum aculeatum gracillimum* 'Cranfield No. 3' (votes unanimous), from W. B. Cranfield, Esq., Enfield. This interesting woodland fern was raised from *Polystichum aculeatum pulcherrimum* (Bevis), which is a reputed wild hybrid between *P. angulare* and *P. aculeatum*. It has very handsome long pale green fronds with brown stems and delicately serrated pinnules.

To *Polystichum aculeatum gracillimum* 'Cranfield No. 11' (votes 11 for, 4 against), from W. B. Cranfield, Esq., Enfield. This is of similar origin to the foregoing variety, but has longer fronds and smaller pinnules.

Other Exhibits.

Cambridge Botanic Garden: *Clematis Thunbergii*.

Mr. Klinkert, Richmond: clipped Box and Yew trees.

C. T. Musgrave, Esq., Godalming: *Berberis* 'Hascombe Sunbeam.'

Mr. R. C. Notcutt, Woodbridge: *Elsholtzia Stauntoni*.

Mr. A. Perry, Enfield: Lilies and ferns.

Messrs. Watson, Killiney: *Berberis barabarossa*.

FLORAL COMMITTEE, NOVEMBER 2, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended:—*Silver-gilt Banksian Medal.*

To Messrs. Peed, West Norwood, for Begonias.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.

To Dame Alice Godman, Horsham, for Nerines.

To Messrs. Hewitt, Solihull, for Chrysanthemums.

To Messrs. S. Low, Enfield, for Carnations.

To Mr. J. H. Pemberton, Havering, for Roses.

Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations.

Award of Merit.

To Chrysanthemum 'Augusta' (votes unanimous), from Messrs. Luxford, Harlow. A large bright yellow single variety measuring five inches across. It has several rows of florets.

To Chrysanthemum 'Everlasting' (votes unanimous), from Messrs. Luxford, Harlow. A dark crimson single variety with a zone of yellow round the eye. The florets are broad and inclined to incurve.

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To Chrysanthemum 'Thalia' (votes 14 for), from Messrs. Luxford, Harlow. A large dark crimson Japanese Decorative variety with an old gold reverse to the florets.

Other Exhibits.

Dame Alice Godman, Horsham : Nerine 'Alice.'
Mr. J. J. Kettle, Corfe Mullen : Violets.

Section B.

Mr. G. W. E. LODER in the Chair, and thirteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Countess Cawdor, Haslemere, for *Pernettya mucronata*, *Celastrus scandens*.
To Messrs. Russell, Richmond, for shrubs.
To Mr. G. G. Whitelegg, Chislehurst, for dwarf conifers.

Other Exhibits.

Misses Hopkins, Shepperton : hardy plants.
Mr. Klinkert, Richmond : clipped Box and Yew trees.
Sir F. Moore, Dublin : *Cotoneaster* F 11190.
Mr. F. G. Wood, Ashted : shrubs.

FLORAL COMMITTEE, NOVEMBER 16, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and eighteen other members present.

Awards Recommended :—

Gold Medal.

To the British Florists' Federation, London, for Chrysanthemums.
To Mr. H. J. Jones, Lewisham, for Chrysanthemums.

Silver Banksian Medal.

To Messrs. Cragg, Harrison & Cragg, Heston, for Chrysanthemums.
To Messrs. S. Low, Enfield, for Carnations and Chrysanthemums.
To Messrs. Luxford, Harlow, for Chrysanthemums.
To Mr. A. G. Vinten, Balcombe, for Chrysanthemums.

Silver-gilt Banksian Medal.

To Messrs. Peed, West Norwood, for Begonias.

Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.
To Messrs. Engelmann, Saffron Walden, for Carnations.

Award of Merit.

To Chrysanthemum 'Beatrice' (votes 15 for, 3 against), from Mr. G. Carpenter, Byfleet. A very refined Decorative variety of a pleasing pale lilac-blush colour.

To Chrysanthemum 'Grenadier' (votes unanimous), from Mr. H. Shoesmith, Jun., Mayford, Woking. A very attractive bright fiery-red single variety.

To Chrysanthemum 'Hon. Margaret Smith' (votes unanimous), from Viscount Hambledon (gr. Mr. W. Turnham), Henley-on-Thames. A large single terra-cotta variety with several rows of florets and a yellow ring round the eye. It is reported to be the result of a cross between the varieties 'Supreme' and 'Audrey.'

To Chrysanthemum 'Lady Brunton' (votes 20 for), from Messrs. Luxford, Harlow. A rich golden-bronze Decorative variety.

To Chrysanthemum 'Rita' (votes unanimous), from Mr. H. Shoesmith, Jun., Mayford, Woking. A good light chestnut-red single with a yellow zone round the eye.

To Chrysanthemum 'W. Renshaw' (votes unanimous), from Messrs. Luxford, Harlow. A large Japanese Decorative variety of a rosy-apricot shade with a buff reverse and curled florets.

Other Exhibits.

Messrs. Barham & Wood, Edmonton : Chrysanthemums.
Mr. J. Barrell, Bridgwater : Chrysanthemums.
Mr. F. Gooch, Stockbridge : Chrysanthemums.
Mr. W. Hall, Witley : Chrysanthemums.
Mr. J. J. Kettle, Corfe Mullen : Violets.
Mrs. C. W. Walsh, Dunsfold : Chrysanthemums.

Section B.

Mr. G. W. E. LODER in the Chair, and fourteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Mr. G. Reuthe, Keston, for conifers and shrubs.

Silver Banksian Medal.

To Mr. G. G. Whitelegg, Chislehurst, for conifers and shrubs.

Banksian Medal.

To Mr. Klinkert, Richmond, for clipped Box and Yew trees.
To Messrs. Russell, Richmond, for shrubs.

Award of Merit.

To Croton 'H. G. Cooper' (votes 7 for), from Messrs. Cragg, Harrison & Cragg, Heston. A very handsome stove foliage plant the dark green leaves of which are mottled with gold, yellow and red shades.

Other Exhibits.

Mrs. Dykes, Sutton Green : *Crocus Boryi marathonisius*, A.M. 1906.
Mr. H. Hemsley, Crawley : shrubs and alpine plants.
Misses Hopkins, Shepperton : shrubs.

FLORAL COMMITTEE, NOVEMBER 30, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To Messrs. Luxford, Harlow, for Chrysanthemums.
To Messrs. Peed, West Norwood, for Begonias.

Silver Banksian Medal.

To Messrs. Allwood, Haywards Heath, for Carnations.
To Messrs. Cragg, Harrison & Cragg, Heston, for Chrysanthemums.
To Messrs. Silvester, London, for Cyclamen, Primulas, etc.
To Mr. A. G. Vinten, Balcombe, for Chrysanthemums.

Banksian Medal.

To Messrs. Barham & Wood, Edmonton, for Chrysanthemums.
To Messrs. Engelmann, Saffron Walden, for Carnations.
To Messrs. Hewitt, Solihull, for Chrysanthemums.

Award of Merit.

To Carnation 'Royalty' (votes 15 for), from Messrs. W. E. Wallace, Eaton Bray. A perpetual flowering variety of excellent form. The colour is scarlet lightly striped with slate-grey.

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To Carnation 'The Favourite' (votes unanimous), from Messrs. W. E. Wallace, Eaton Bray. A very large salmon-pink perpetual-flowering variety. The flowers are beautiful in form and are borne on long stout stems.

To Chrysanthemum 'Aloma' (votes unanimous), from Messrs. Luxford, Harlow. A very large straw yellow incurved Japanese variety with medium to broad florets.

To Chrysanthemum 'Clarice' (votes unanimous), from Messrs. Luxford, Harlow. A large bright red single variety with a yellow zone round the disc.

To Chrysanthemum 'Golden Climax' (votes 16 for), from Mr. H. J. Jones, Lewisham. A very neat bright golden-yellow Pompon variety.

To Chrysanthemum 'Guardsman' (votes unanimous), from Mr. H. Shoesmith, Jun., Mayford, Woking. A large bright velvety crimson single variety.

To Chrysanthemum 'Ruddigore' (votes 16 for), from Messrs. Cragg, Harrison & Cragg, Heston. A small neat Japanese Decorative variety with glowing chestnut-red flowers having an old gold reverse to the florets.

To Chrysanthemum 'Valerice' (votes unanimous), from Messrs. Luxford, Harlow. A small and very neat reddish terra-cotta single variety with a very narrow yellow band round the eye.

Other Exhibits.

Lady de Capell Brooke, Kettering : Chrysanthemum sport.

Mr. F. W. Dodd, Mill Hill : Chrysanthemum sport.

Mr. J. W. Euston, Basingstoke : Chrysanthemum seedlings.

Mr. J. Godber, Bedford : Chrysanthemum 'Red Elsie Bell.'

Viscount Hambledon, Henley-on-Thames : Chrysanthemum 'Mrs. W. Turnham.'

Mr. H. Hemsley, Crawley : Chrysanthemums.

Misses Hopkins, Shepperton : hardy plants.

Mrs. E. W. Johnson, Tunbridge Wells : Chrysanthemum 'Mrs. E. W. Johnson.'

Mr. J. J. Kettle, Corfe Mullen : Violets.

G. Mayer, Esq., Woldingham : Chrysanthemum 'Isobel Codrington.'

Messrs. Scott & Wickham, Witley : Chrysanthemums.

Messrs. Treseder, Cardiff : Chrysanthemum 'Mrs. W. H. Brain.'

Section B.

Mr. G. W. E. LODER in the Chair, and eleven other members present.

Awards Recommended :—

Silver Banksian Medal.

To the Orpington Nurseries, Orpington, for shrubs and conifers.

To Mr. G. G. Whitelegg, Chislehurst, for conifers.

Banksian Medal.

To Miss G. Howe, Golders Green, for miniature gardens.

To *Ruscus aculeatus* (monoecious form), (votes 9 for), from G. W. E. Loder, Esq., Ardingly. A good form of the native Butcher's Broom bearing large scarlet berries with great freedom on the flattened leaf-like branches.

Other Exhibits.

Mr. H. Hemsley, Crawley : shrubs and conifers.

Mr. Klinkert, Richmond : clipped Box and Yew trees.

FLORAL COMMITTEE, DECEMBER 14, 1926.

Section A.

Mr. H. B. MAY, V.M.H., in the Chair, and nineteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. S. Low, Enfield, for Carnations.

To Messrs. Luxford, Harlow, for Chrysanthemums.

To Mr. A. G. Vinten, Balcombe, for Chrysanthemums.

Banksian Medal.

To Messrs. Engelmann, Saffron Walden, for Carnations.

Award of Merit.

To Chrysanthemum 'Fusilier' (votes unanimous), from Mr. H. Shoesmith, Jun., Mayford, Woking. A large rich crimson single variety with a very narrow yellow ring round the disc.

To Chrysanthemum 'Lavinia' (votes 17 for, 3 against), from Mr. H. Shoesmith, Jun., Mayford, Woking. A bronzy-apricot single variety with broad florets and a narrow yellow zone round the disc.

To Chrysanthemum 'Yellow Favourite' (votes 15 for, 3 against), from Mr. A. G. Vinten, Balcombe. A pale sulphur-yellow sport from the Decorative variety 'Favourite.'

Other Exhibits.

Messrs. Allwood, Haywards Heath : Carnations.

Mr. G. Carpenter, Byfleet : Carnations.

Mr. J. J. Kettle, Corfe Mullen : Violets.

Messrs. Tebbs, Hurstpierpoint : Chrysanthemum 'Halo.'

Mr. H. Woolman, Birmingham : Chrysanthemum 'Crimson Conquest.'

Section B.

Mr. G. W. E. LODGE in the Chair, and sixteen other members present.

Awards Recommended :—*Gold Medal.*

To Hon. Vicary Gibbs (gr. Mr. E. Beckett), Elstree, for berried and other shrubs.

Silver Banksian Medal.

To Mr. A. Perry, Enfield, for hardy ferns.

Banksian Medal.

To Miss G. Howse, Golders Green, for miniature gardens.

To the Orpington Nurseries, Orpington, for conifers and other shrubs.

Other Exhibits.

Mr. Klinkert, Richmond : clipped Box and Yew trees.

Mr. G. F. Wood, Ashted : shrubs and miniature gardens.

ORCHID COMMITTEE.

JULY 13, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and twelve other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Sanders, St. Albans, for a group representing eighteen different genera.

To Messrs. Cowan, Southgate, for a group.

To Messrs. Charlesworth, Haywards Heath, for novelties and uncommon species.

Award of Merit.

To *Laeliocattleya* × *Robertsoniae* var. 'Milly' (*L.-c.* × *luminosa aurea* × *C.* × 'Maggie Raphael alba') (votes unanimous), from Messrs. Black & Flory, Slough. A pleasing hybrid with lemon-yellow sepals and petals and deep-purple labellum.

Cultural Commendation.

To E. R. Ashton, Esq., Tunbridge Wells (gr. Mr. C. V. Kent), for *Laeliocattleya* × 'Aphrodite,' Broadlands var., with three spikes and a total of eleven flowers.

ORCHID COMMITTEE, JULY 27, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and nine other members present.

Awards Recommended :—

Silver-gilt Banksian Medal.

To H. T. Pitt, Esq., Rosslyn, Stamford Hill, for group of species and hybrids.

Award of Merit.

To *Sophrolaeliocattleya* × 'Prudence' (*S.-l.* × 'Laeta' × *C.* × 'Fabia') (votes unanimous), from Lieut.-Col. Sir George Holford, Westonbirt, Tetbury, Glos. A beautiful hybrid with flowers of medium size, rose-purple, with a crimson overtint, the lip bordered with ruby-crimson and the throat veined with gold.

To *Odontioda* × 'Esme' ('Manora' × 'Red Cross') (votes 5 for, 2 against), from Messrs. Charlesworth & Co., Haywards Heath. A pretty hybrid with roundly formed flowers of reddish-rose, the crest prominently developed.

Preliminary Commendation.

To *Vanda* × *Herziana* (*coerulea* × *suavis*) (votes unanimous), from Messrs. Charlesworth & Co., Haywards Heath. The small plant bore but one flower, with bright bluish markings on a rose ground.

Cultural Commendation.

To Mr. Thurgood, gardener to H. T. Pitt, Esq., Rosslyn, Stamford Hill, for a fine example of *Coelogyne Sanderiana*, with about a hundred flowers.

To Messrs. Sutton Bros., Hassocks, for *Odontoglossum* × 'Cleopatra' var. 'Memoria Lionel Crawshaw' with a branched spike bearing fifty-three buds and flowers.

Other Exhibits.

Messrs. Charlesworth & Co., Haywards Heath: *Cattleya* × 'Hesta' and *Odontoglossum Insleyi splendens aureum*.

Baron Bruno Schröder, Englefield Green, Surrey: *Brassolaeliocattleya* × 'Helios,' of rich yellow colour.

Messrs. Black & Flory, Slough: *Sophrocattleya* × 'S. W. Flory,' dark red, and *Cattleya* × 'Aphrodite' *superba*.

ORCHID COMMITTEE, AUGUST 10, 1926.

H. T. PITT, Esq., in the Chair, and ten other members present.

Awards Recommended :—*Gold Medal.*

To Baron Bruno Schröder, Englefield Green, Surrey, for a superb group of Cattleyas, comprising over a hundred specimens, mostly of *C. × Hardyana alba*.

Silver-gilt Lindley Medal.

To Mr. J. E. Shill, for skilful cultivation of Orchids in Baron Schröder's group.

Silver Banksian Medal.

To Messrs. Sanders, St. Albans, for group of species and hybrids.

Vote of Thanks.

To W. van Deventer, Esq., The Hague, Holland, for cut-spike of *Vanda × 'Emma van Deventer' (tricolor × teres)*.

To Messrs. Stuart Low & Co., Jarvisbrook, Sussex, for exhibit of Cattleya hybrids.

ORCHID COMMITTEE, AUGUST 24, 1926.

H. T. PITT, Esq., in the Chair, and nine other members present.

Awards Recommended :—*Silver Banksian Medal.*

To H. T. Pitt, Esq., Rosslyn, Stamford Hill, N., for species and hybrids.

First-class Certificate.

To *Potinara × 'La Paz' (S.-c. × 'Faboris' × B.-l.-c. × 'The Baroness')* (votes unanimous), from Baron Bruno Schröder, The Dell Park, Englefield Green, Surrey. The flower is comparatively large, of model form, the sepals and petals clear yellow, the labellum orange-yellow with some reddish markings in the centre and with a marginal zone of ruby-crimson.

Award of Merit.

To *Odontioda × 'Nubia' (Oda. × 'Eric' × Odm. × 'Georgius Rex')* (votes unanimous), from Messrs. Charlesworth, Haywards Heath, Sussex. The immature seedling bore a branched spike of seven flowers, of intense chocolate-crimson, except for some whitish lines on the petals and the bright golden crest of the labellum.

To *Laeliocattleya × 'Jacquinetta' (C. × 'Empress Frederick' × L.-c. × 'Lustre')* (votes unanimous), from Messrs. Stuart Low, Jarvisbrook, Sussex. Flowers of large size, and rich purple throughout all the segments, the labellum of deeper colour on the front lobe.

Cultural Commendation.

To Messrs. Armstrong & Brown, Tunbridge Wells, for *Dendrochilum filiforme*, with thirty-eight pendulous racemes.

Other Exhibits.

Messrs. Black & Flory, Slough: various Cattleya hybrids derived from *C. Warscewiczii* var. 'F. M. Beyrodt.' The flowers are white, with purple on the labellum.

E. R. Ashton, Esq., Broadlands, Tunbridge Wells: cut-flower of *Cattleya × 'Judah' var. 'Goldcrest'*, of fine form and colour.

Messrs. Charlesworth: *Odontonia × 'Nesta'*, purplish, with crimson markings.

ORCHID COMMITTEE, SEPTEMBER 7, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Sanders, St. Albans, for group of Orchids.

First-class Certificate.

To *Brassolaeliocattleya* × 'Irma' (*B.-l.-c.* × 'The Baroness' × *L.-c.* × 'Golden Queen') (votes unanimous), from Baron Bruno Schröder, The Dell Park, Englefield Green, Surrey. A beautiful hybrid with the segments well formed and arranged. The sepals old gold, the petals lighter, but tinged with apricot, the labellum orange-flame, bordered with cerise-purple.

Award of Merit.

To *Odontonia* × 'Regina' (*Odontonia* × 'Gladys' × *Odontoglossum* × 'Doreen') (votes 9 for, 2 against), from Messrs. Charlesworth, Haywards Heath. The influence of *Miltonia vexillaria* is seen in the widely developed labellum, which is profusely spotted with rose-purple.

To *Laeliocattleya* × 'Cantab' var. 'Sunset' (*C. Ballantineana* × *L.-c.* × 'St. Gothard') (votes 13 for, 2 against), from Messrs. Stuart Low, Jarvisbrook. The spike bore three rich purple flowers with a crimson over-tint. The labellum was darker, with golden venation in the area of the throat.

Other Exhibits.

Messrs. Stuart Low: *Cattleya* × 'Suavior' var. 'Triumph,' in which the petals are strongly flushed with purple.

Messrs. Charlesworth: *Miltonia* × 'Princess Mary,' and other hybrids.

Messrs. McBean: *Cattleya* × *Hardyana alba*, *C.* × 'Falco,' and a fine form of *Odontoglossum* × *Uro-Skinneri*.

Leonard Dixon, Esq., Stanstead Abbots: *Cypripedium Gowerianum* var. 'Mrs. L. Dixon,' in which the flowers are emerald-green, the dorsal sepal with some white, and with wart-like markings on the petals.

Messrs. Sutton Bros.: *Eria convallarioides*.

Sir Jeremiah Colman, Bt.: a little seedling *Laeliocattleya*, about two years old, the apical portion having some petal-like segments of mauve colour.

ORCHID COMMITTEE, SEPTEMBER 21, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver-gilt Flora Medal.

To Messrs. Cowan, Southgate, for autumn-flowering Orchids.

To Messrs. Black & Flory, Slough, for autumn-flowering *Cattleyas*.

Silver-gilt Banksian Medal.

To Messrs. Stuart Low, Jarvisbrook, Sussex, for various Orchids.

Award of Merit.

To *Laeliocattleya* × 'Profusion' var. 'Stamperland' (*C.* × *Hardyana* × *L.-c.* × 'Serbia') (votes 9 for), from Robert Paterson, Esq., Cathcart, Glasgow. Flowers large, uniform rosy-mauve, labellum intense purple, with a yellowish disc on each side lobe.

To *Cattleya* × 'Mimosa' var. 'Golden Queen' ('Venus' × *triumphans*) (votes unanimous), from Messrs. Cowan, Southgate. Flower well proportioned, of thick texture, golden-yellow, except for the ruby-crimson labellum.

To *Laeliocattleya* × 'General Maude' var. *splendens* (*C.* × *Hardyana* × *L.-c.* × 'Rubens') (votes 7 for), from Messrs. Cowan. The flowers are large, rich mauve-purple, the round labellum purple-crimson, and the throat veined with gold.

To *Brassolaeliocattleya* × 'C. W. Matthes' (*B.-I.-c.* × 'The Baroness' × *C.* × 'Maggie Raphael alba') (votes unanimous), from Messrs. Stuart Low. An attractive clear yellow flower, unusually bright, the labellum with a few cerise markings.

To *Cattleya* × 'Lorna' var. 'Empress' (*C. Warszewiczii* × *C.* × 'Enid') (votes 9 for), from Messrs. Black & Flory. The wide flower has white sepals and petals, and purple mottling on the disc of the labellum, the tube portion of the throat being yellow.

Other Exhibit.

Messrs. Charlesworth: *Odontioda* × 'Pamela' var. *autumnalis*, with a spike of nine large flowers, the white apex of the labellum being conspicuous.

ORCHID COMMITTEE, OCTOBER 5, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and fifteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Sanders, for species and hybrids.

First-class Certificate.

To *Cattleya* × 'Gilvus' (*Hardyana alba* × 'Heliodor') (votes unanimous), from Baron Bruno Schröder, The Dell Park, Englefield Green. Flower of model form, the broad petals overlapping in front of the dorsal sepal. Clear golden-yellow, with carmine markings on the lip.

To *Brassolaeliocattleya* × 'Elektron' (*B.-I.-c.* × 'Amber' × *C.* × *Hardyana alba*) (votes 10 for), from Baron Bruno Schröder. A very fine hybrid with yellow sepals and petals. The round labellum has a golden centre and a bright rose-coloured margin.

Award of Merit.

To *Cattleya* × 'John Henry' ('Astron' × 'Lady Rowena') (votes unanimous), from Baron Bruno Schröder. The flower is of thick texture, pure white, except for some lemon-yellow in the throat.

To *Brassolaeliocattleya* × 'Helios' (*B.-I.-c.* × 'The Baroness' × *C. triumphans*) (votes unanimous), from Baron Bruno Schröder. The sepals and petals are yellow, somewhat deeper than usual, the labellum rich carmine tinged with ruby.

To *Brassocattleya* × 'Miranda,' Low's var. (*B.-c.* × 'Mrs. J. Leemann' × *C.* × 'Iris') (votes 13 for), from Messrs. Stuart Low. Flower of large size, clear yellow, the labellum having a cerise border, with the centre golden.

To *Cattleya* × *ardentissima*, St. Albans var. ('Fabia' × *Pectersii*) (votes unanimous), from Messrs. Sanders. An improved form of the hybrid; rich purple, with a crimson tinge, the labellum deep ruby crimson, the throat with golden venation.

Other Exhibits.

Messrs. Stuart Low: two fine varieties of *Brassocattleya* × 'Hannibal.'

Messrs. Black & Flory: *Cattleya* × 'Marlow,' with cream sepals and petals, and *Laeliocattleya* × 'Vivid,' golden-orange.

Messrs. Charlesworth: *Brassolaeliocattleya* × 'Neptune,' with round flowers of rosy-mauve colour.

Messrs. Cowan: *Laeliocattleya* × 'Pandora,' rose-purple tinged with red.

Messrs. Sutton Bros.: *Laeliocattleya* × 'Warham.'

ORCHID COMMITTEE, OCTOBER 19, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and nineteen other members present.

Awards Recommended :—

Williams Memorial Medal.

To Messrs. Sanders, for rare species and attractive hybrids.

To Messrs. Charlesworth, for group of Dendrobiums and Oncidiums.

cxiv PROCEEDINGS OF THE ROYAL HORTICULTURAL SOCIETY.

Schröder Challenge Cup.

To R. Gerrish, Esq., Milford Manor, Salisbury, for autumn-flowering Cattleyas.

Challenge Cup offered by the Orchid Trade.

To J. J. Joicey, Esq., The Hill, Witley, Surrey, for species and hybrids.

Silver-gilt Banksian Medal.

To H. T. Pitt, Esq., Rosslyn, Stamford Hill, for various Orchids.

To Messrs. Cowan, for autumn-flowering hybrids.

To Messrs. Stuart Low, for choice hybrids.

Silver Banksian Medal.

To Messrs. J. Cypher, for *Cypripedium* hybrids.

To Messrs. Sutton Bros., for various Orchids.

To Mr. Harry Dixon, for species and hybrids.

Silver Trophy.

To Ernest R. Ashton, Esq., Camden Park, Tunbridge Wells, for the best six Orchids shown by an amateur.

Vote of Thanks.

To Sir Jeremiah Colman, Bt., Gatton Park, Surrey, for an interesting non-competitive exhibit of autumn-flowering Orchids.

First-class Certificate.

To *Brassolaeliocattleya* × 'Ambersolis' (*B.-l.-c.* × 'Amber' × *C.* × 'Sunbeam') (votes unanimous), from Baron Bruno Schröder, The Dell Park, Englefield Green. The flower is of model form and of a pleasing rich yellow, the labellum having a cerise margin and a golden centre.

Award of Merit.

To *Brassolaeliocattleya* × 'Salta' (*C.* × 'Suzanne Hye' × *B.-l.-c.* × 'The Baroness') (votes unanimous), from Baron Schröder. The flowers have clear yellow sepals and petals, the labellum having a light rose border and frilled margin.

To *Laeliocattleya* × 'Minos' var. *rubra* (*L.-c.* × 'Rubens' × *C.* × 'Tityus') (votes unanimous), from R. Gerrish, Esq., Milford Manor, Salisbury. Flowers of medium size, rich crimson-purple, the labellum having the front tinged with ruby.

To *Laeliocattleya* × 'Zeno,' Rosslyn var. (*L.-c.* × 'St. Gothard' × *C. Luegeae*) (votes 16 for), from H. T. Pitt, Esq., Rosslyn, Stamford Hill. Large flowers, uniform mauve-purple in sepals and petals, labellum much darker.

To *Cypripedium* × 'Lord Wolmer,' var. 'Orbis' (*C.* × 'Hera' × *C.* × *Lecanum*) (votes 14 for, 2 against), from Messrs. Sanders. A showy hybrid with a round dorsal sepal, white with a light green base and with evenly distributed bold spotting.

To *Odontoglossum* × 'Dusky Prince' (parentage unrecorded) (votes 11 for, 4 against), from Messrs. Stuart Low. A promising hybrid, each segment almost covered with a solid purplish blotch.

Cultural Commendation.

To Mr. C. V. Kent, for a well-grown plant of *Sophrolaeliocattleya* × 'Anzac,' Broadlands var., with three spikes and six reddish terra-cotta flowers. Exhibited by E. R. Ashton, Esq., Camden Park, Tunbridge Wells.

ORCHID COMMITTEE, NOVEMBER 2, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and thirteen other members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Sanders, St. Albans, for *Cypripediums* and other Orchids.

To Messrs. Cowan, Southgate, for autumn-flowering hybrids.

Silver Lindley Medal.

To Mr. J. E. Shill, in recognition of the fine strain of yellow-flowering hybrids which have been raised by him in the collection of Baron Bruno Schröder.

First-class Certificate.

To *Brassolaeliocattleya* × 'Margery' (*B.-l.-c.* × 'The Baroness' × *C.* × *Hardyana alba*) (votes unanimous), from Baron Bruno Schröder, The Dell Park, Englefield Green, Surrey. Of comparatively large size, this beautiful flower has the sepals amber-yellow, and the petals rich chrome-yellow, with the margins undulated; the labellum is bordered with rose mottling, and has a golden disc on each side lobe.

Award of Merit.

To *Brassolaeliocattleya* × 'Flavida' (*B.-l.-c.* × 'Amber' × *L.-c.* × 'Golden Queen') (votes unanimous), from Baron Bruno Schröder. Flower of model form, clear yellow, the labellum having a well-defined rose-coloured zone around the margin.

To *Laeliocattleya* × 'Pamela' (*C.* × 'Princess Royal' × *L.-c.* × 'Feronia') (votes unanimous), from Messrs. Cowan, Southgate. An attractive purple-mauve flower, much richer than usually seen, and with a crimson over-tint; the labellum intense crimson.

To *Brassocattleya* × 'Rex' (*C.* 'Rex' × *B. Digbyana*) (votes 9 for, 2 against), from Messrs. Stuart Low, Jarvisbrook, Sussex. This has the form of a glorified *Brassavola Digbyana*, light yellowish-green in all the segments, the lip deeply fringed.

To *Brassocattleya* × 'Alderman' var. 'Mars' (*B.-c.* × 'Nestor' × *C. aurea*) (votes unanimous), from Messrs. Black & Flory, Slough. Flower large, rosy-mauve, with an attractive fringed labellum.

Other Exhibits.

Messrs. Charlesworth: *Angraecum distichum* and the uncommon *Bifrenaria aureo-fulva*.

Messrs. Stuart Low: *Laeliocattleya* × 'Mrs. Medo,' with yellow sepals and petals, and *Cypripedium* × 'Lucinda,' a handsome hybrid.

Messrs. Black & Flory: *Brassocattleya* × 'Alderman,' a large uniform mauve-pink flower.

Messrs. McBean: two fine examples of *Laeliocattleya* × 'Profusion.'

John E. Parry, Esq., Rustington, Littlehampton: cut flowers of *Brassocattleya* × *Digbyana-Schroederiae*, of a pleasing rose tint.

ORCHID COMMITTEE, NOVEMBER 16, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and sixteen other members present.

Awards Recommended:—*Silver Banksian Medal.*

To Messrs. Sanders, St. Albans, for species and hybrids.

First-class Certificate.

To *Laeliocattleya* × 'Aconcagua' (*L.-c.* × *Schroederiae* × *C.* × 'Maggie Raphael' *alba*), (votes 14 for, 1 against), from Baron Bruno Schröder, The Dell Park, Englefield Green, Surrey. This beautiful hybrid bore a spike of three flowers of model form, the sepals and petals pure white, the labellum rose-purple, very bright around the outer zone, the disc portion with a crimson tinge.

To *Laeliocattleya* × 'Profusion' var. 'Titanic' (*C.* × *Hardyana* × *L.-c.* × 'Serbia') (votes 14 for), from F. J. Hanbury, Esq., Brockhurst. Perhaps the largest of the varieties so far seen of this hybrid, rich purple-mauve throughout, the labellum much darker.

Award of Merit.

To *Odontoglossum* × 'Frank Reader' ('King Albert' × 'General Foch') (votes 12 for, 1 against), from Messrs. Armstrong & Brown, Tunbridge Wells. An attractive hybrid with a spike of fourteen flowers, the segments heavily blotched with chocolate-red.

Cultural Commendation.

To Mr. F. W. Thurgood, orchid grower to H. T. Pitt, Esq., Rosslyn, Stamford Hill, for *Vanda luxonica*, well-leaved, and with a couple of many-flowered spikes.

Other Exhibits.

J. J. Joicey, Esq., The Hill, Witley: *Vanda luxonica witleyensis*, with three spikes and a total of thirty-five flowers.

Messrs. Charlesworth: *Brassocattleya* × 'British Queen,' with large rose flowers.

Messrs. McBean: *Odontoglossum* × *Jamesianum*, rich purple, and the new *Laeliocattleya* × 'Valencia.'

Messrs. A. J. Keeling: two distinct varieties of *Cypripedium* × 'Christopher,' *Cypripedium* × 'St. Germain,' and *Odontoglossum* × 'Tigris,' derived from *O. Edwardii*.

Messrs. Armstrong & Brown: *Miltonia* × *Hyeana* and *Odontoglossum* × 'Evana.'

Messrs. Black & Flory: the new *Cattleya* × 'Princess Astrid,' and *Cattleya* × 'Molly,' resembling an improved *C. labiata*.

Mr. Harry Dixon, Wandsworth Common: various *Cypripedium* hybrids and *Sophrocattleya* × 'Helen.'

Mr. H. G. Alexander, Westonbirt, Tetbury: *Laeliocattleya* × 'Mrs. Chamberlain Chandler' var. *magnifica*, a showy hybrid.

ORCHID COMMITTEE, NOVEMBER 30, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and sixteen other members present.

Awards Recommended:—

Silver-gilt Banksian Medal.

To H. T. Pitt, Esq., Rosslyn, Stamford Hill, for *Cypripedium* hybrids.

To Messrs. H. G. Alexander, Westonbirt, Tetbury, Glos., for various hybrids.

Silver Banksian Medal.

To Messrs. Sanders, St. Albans, for species and hybrids.

To Messrs. Charlesworth, Haywards Heath, for species and new hybrids.

To Messrs. Black & Flory, Slough, for *Cattleya* hybrids.

To Messrs. Cowan, Southgate, for *Cypripedium* hybrids.

Award of Merit.

To *Cypripedium* × 'Nesta,' Westonbirt var. ('Lucifer' × 'Earl of Tankerville') (votes 10 for, 4 against), from Messrs. H. G. Alexander. A neatly formed flower in which the flat dorsal sepal is white, with purplish spots in vertical lines, the lower half stained with rose, and the basal part green. The petals are yellowish, heavily suffused with mahogany-red.

To *Brassolaeliocattleya* × 'Mithra' (*B.-c.* × 'Sofrano' × *B.-l.-c.* × 'Amber') (votes 14 for, 1 against), from Baron Bruno Schröder, Englefield Green, Surrey. Flower comparatively large and rich yellow, the round, openly displayed labellum almost devoid of the rose and purplish colours usually seen in *Cattleyas*.

To *Brassolaeliocattleya* × 'Cytheria' (*B.-c.* × 'Mrs. J. Leemann' × *B.-l.-c.* × 'The Baroness') (votes 11 for, 2 against), from Messrs. McBean, Cooksbridge, Sussex. Flower rich yellow, with broad sepals and petals, the latter undulated at the margin, the labellum with a narrow border of rose.

Other Exhibits.

Messrs. A. J. Keeling, Bradford: *Cypripedium* hybrids, and *Calanthe* × 'Angela.'

Mr. Harry Dixon, Wandsworth Common: *Brassocattleya* × 'Nestor,' and *Cypripedium* hybrids.

J. B. Adamson, Esq., Daggers Hall Lane, Blackpool: *Odontoglossum* × 'Everest' (F.C.C. 1920).

Baron Bruno Schröder: *Cattleya* × 'Esther Waldegrave,' with a spike of four white flowers.

Messrs. McBean: six examples of *Cypripedium insigne* var. 'Royalty.'

Messrs. Armstrong & Brown, Tunbridge Wells: *Brassolaeliocattleya* × 'Elysian,' var. 'Aureate,' rich yellow in all the segments, and *Cypripedium* × 'Conqueror,' unusually large, with the dorsal sepal deep rose.

Dr. Craven Moore, Victoria Park, Manchester: *Cypripedium* × 'Monialis' var. 'Hilda Sharp,' a pretty flower showing much of the character of *C.* × 'Niobe.'

Messrs. Sutton Bros.: *Lycaste* × 'Beryl' and several hybrid *Cypripediums*.

ORCHID COMMITTEE, DECEMBER 14, 1926.

Sir JEREMIAH COLMAN, Bt., in the Chair, and eighteen other members present.

Awards Recommended:—

Gold Medal.

To Robert Paterson, Esq., Stamperland House, Cathcart, Glasgow, for winter-flowering Orchids.

Silver Banksian Medal.

To Messrs. Cowan, Southgate, for winter-flowering Orchids.

To Capt. Maitland Drummond, Cadland Park, Southampton, for *Cypripedium* species and hybrids.

To Messrs. Sanders, St. Albans, for many rare species.

Bronze Banksian Medal.

To Messrs. J. Cypher, Cheltenham, for *Cypripedium* hybrids.

First-class Certificate.

To *Odontonia* × 'Nesta,' Stamperland var. (*Odontioda* × 'Gladys' × *Odontoglossum* × 'St. George') (votes unanimous), from Robert Paterson, Esq., Cathcart, Glasgow. The spike bore seven flowers, the segments flat, rose-tinted, and with heavy reddish-purple blotching.

Award of Merit.

Cypripedium × 'Bendigo' ('Niobe' × 'Bronzino') (votes 15 for), from Messrs. H. G. Alexander, Westonbirt, Tetbury, Glos. A charming flower with the dorsal sepal suffused rose-crimson, the petals much undulated on the upper margin, and mahogany-red.

To *Vuykstekeara* × 'Merola' (*Miltonia Charlesworthii* × *Odontioda* × 'Hemera') (votes 11 for, 1 against), from Messrs. Charlesworth, Haywards Heath. A pretty novelty, the flower almost entirely rose, with light crimson shading.

Other Exhibits.

Messrs. A. J. Keeling, Bradford: *Cypripedium* × 'Mrs. Eley,' with a round dorsal sepal, white with a few spots; *Odontioda* × 'Ruby'; and the F.C.C. variety of *Odontioda* × 'Hypatia.'

H. Worsley, Esq., Haslingden, Lancs.: three finely flowered examples of *Cypripedium* × *Worsleyi*, with unusually long leaves, the flower somewhat cup-shaped, large, the dorsal sepal white and heavily spotted.

Messrs. Charlesworth: *Sophrolaeliocattleya* × 'Garnet' (S.-I.-c. 'Marathon' × *C.* 'Rhoda').

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Abbreviations.—cor. = corrected; il. = illustrations; introd. = introduction; pl. = plates; col. pl. = coloured plates; frontis. = frontispiece; portr. = portrait; enl. = enlarged; coloph. = colophon; pref. = preface; rev. = revised.

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- JONES, J. W., Woking. *Narcissus Bulbocodium conspicuum*, Dahlias.
- JORDAN, F., Lingfield. Plants and seeds of *Chianthus magnifica*.
- KAY, J., British Columbia. Collection of seeds.
- KEENE, R. W., St. Albans. *Streptosolen Jamesonii*.
- KEIR, D., Blairgowrie. Potato for trial.
- KELWAY, Messrs., Langport. Aubrietias, Peas, Savoys, Cabbages, Linum, Nemesis, Nigella, Nemophilas, Aquilegias, Gladioli, for trial.
- KENT, W. G., Wisbech. Apples, Gooseberries, Raspberries, for trial.
- KENT & BRYDON, Messrs., Darlington. Irises for trial.
- KETTEN BROS., Messrs. Roses for trial.
- KEW BOTANIC GARDENS. Seed of *Calceolaria Darwinii*; *Rosa Hugonis*; *Thalictrum dipterocarpum*.
- KIEV BOTANIC GARDENS, Russia. Collection of seeds.
- KIRCH, Mr., Beckenham. *Saxifraga* 'Miss Grace Farnell'; miscellaneous seeds.
- KONYNENBURG & MARK, Messrs., Holland. Gladioli for trial.
- KUNDERD, A. E., U.S.A. Gladioli for trial.
- LACAITA, C. C., Petworth. *Adenocarpus decorticans* from Sierra Nevada; seed of *Erica umbellata*; *Erica multiflora*.
- LA MORTOLA, VENTIMIGLIA, Italy. Seed of *Naudina domestica*.
- LAWRENCE, Sir Wm., Dorking. *Iris Reichenbachiana* for trial, Cauliflowers and Mexican Tree Spinach; miscellaneous seeds.
- LAWTON, H. A., New Zealand. Seed of *Myosotidium nobile*, *Nothospartium tornosum*, *Sophora grandiflora* N. Carmichaeliae; *Gentiana concinna*, *Veronica Hulkeana Lawtoni*.
- LAXTON, Messrs., Bedford. Strawberries, Black Currants, Gooseberries, Raspberries, Nuts, Culinary Peas, for trial.
- LEENDERS, Messrs. M., Holland. Roses for trial.

- LEMPERG, Dr., Austria. Collection of seeds.
 LEYLAND, C. J., Haggerston Castle. *Cupressus Leylandii*.
 LIÈGE BOTANIC GARDEN, Belgium. Miscellaneous seeds.
 LINDSAY SMITH, Mrs., Handcross. *Dianthus* 'Napoleon III'; *Salvia Grahamii*.
 LOAT, W., Mevagissey. Gladioli for trial.
 LOBJOIT, W. G. Scions of American Plums.
 LODER, R., Northampton. Seeds.
 LOFTHOUSE, T. A., Middlesbrough. Rock plants.
 LOWE & GIBSON, Messrs., Crawley Down. Gladioli for trial.
 MCALISTER, A. W., Dumfries. Potato for trial.
 MCGREDY, Messrs., Portadown. Roses for trial.
 MACLAREN, Hon. H. D., Tal-y-Cafn. Seeds of rock plants.
 MAGOR, S. J., St. Tudy. Seedlings of *Stuartia* sp. F. 24406; and *Photinia* sp. F. 24199.
 MARSDEN JONES, E., Devizes. Seed of *Crocus officinalis*, *Gladiolus illyricus*.
 MARSH, Mrs., Haslemere. Collection of seeds.
 MASON, H., London. Books for Library.
 MASON, H. *Salix lavata Stuartii*.
 MASON, Mrs., Cressage. Seed of Plantain from New Zealand; miscellaneous seeds.
 MAUGER & SONS, Messrs., Guernsey. Freesias, Lachenalias, for trial.
 MEAD, F. B., U.S.A. *Hemerocallis* 'Hyperion.'
 MERRILLS & SONS, Messrs., Halifax. New Pelargonium for trial.
 METZ BOTANIC GARDEN, France. Collection of seeds.
 MILLARD, Mr., East Grinstead. *Stachys lavandifolia*; collection of seeds.
 MILLS, Mrs., Worcester. Double Periwinkle.
 MONRO, G., London. Freesia for trial.
 MONTPELLIER BOTANIC GARDEN. Collection of seeds.
 MORGAN, Mrs., London. *Calodendron capensis*.
 MORSE & Co., Messrs., California. Peas for trial.
 MOSS, F., Oxon. Potatoes for trial.
 MUNICH BOTANIC GARDEN. Miscellaneous seeds.
 MUSGRAVE, C. T., Godalming. *Viola valderia* seedlings; miscellaneous seeds.
 NANTES BOTANIC GARDEN, France. Collection of seeds.
 NEEL, G. W., Canada. Plants of Oriental Poppy.
 NEDEGATE, Sir F., Nuncaton. Miscellaneous seeds; plant of Kangaroo Paw.
 NICOLL, Mrs., Gerrards Cross. Miscellaneous seeds.
 NIEUWENHUIS, Messrs., Holland. Gladioli.
 NIX, C., Crawley. Seed of *Salvia Sonlei*.
 NIX, J. A., Tilgate. *Magnolia Delavayi*.
 NONAE & HOIPKER, Messrs., Hamburg. Irises for trial.
 NORTON, Miss E. M., Cemmaes. *Cotyledon* (syn. *Echeveria gibbiflora*).
 NOTCUTT, R. C., Woodbridge. Collection of plants.
 NUNHAM, Messrs., Holland. Peas, Cabbages, Spinach, for trial.
 NUTTING, Messrs., London. Miscellaneous flower and vegetable seeds for trial.
 OLIVER & HUNTER, Messrs. *Primula Littoniana*; *Lilium philippinense*, Price's var.; *Azalea procumbens*.
 ORPINGTON NURSERY Co., The, Orpington. Iris for trial.
 OSLO BOTANIC GARDENS, Norway. Collection of seeds.
 PARIS, MUSEUM. Miscellaneous seeds.
 PARKER, Capt., France. Two Alpine Primroses.
 PEARSON & SONS, Messrs., Lowdham. Aquilegias for trial.
 PENNELL, Messrs., London. Peas, Cabbage, for trial.
 PERRY, A., Enfield. *Cooperia Drummondii*, *Cooperia pedunculata*; Iris, Trollius, for trial; collection of seeds; *Antholyza* sp.
 PFITZER, Messrs. W., Germany. Gladioli for trial.
 PILKINGTON, G. L., Liverpool. Iris for trial.
 POUPART, W., Twickenham. Rhubarb 'Daw's Champion,' 'The Sutton,' and 'Hawke's Champagne.'
 PRICHARD, Messrs., Christchurch. Aubrietias for trial.
 PRINCESS LOUISE, H.R.H. Book for Library.
 READ, Miss D. H. MOUTRAY, Walhurst. Collection of seed from the Ruwenzori Mountain.
 RICHARDSON, H., Pyrford. Cuttings of *Cistus*.
 RIDING, J. B., Chingford. Dahlias for trial.
 RIVOIRE PÈRE & FILS, Lyon. Celery for trial.
 ROME BOTANIC GARDENS, Italy. Collection of seeds.
 ROSS, Sir J., Ireland. Collection of seeds.
 ROTHSCHILD, L. DE, Exbury. Miscellaneous plants.

- ROUMANIA, HER MAJESTY THE QUEEN OF. Rose 'Martha.'
- ROWLAND, S., Cranleigh. Plants of Blueberry.
- ROY, C. LE, California. *Coreopsis gigantea*.
- RUYS, Messrs., Holland. Aubrietias, Iris, for trial.
- RYDER, Messrs., St. Albans. Peas for trial.
- SALBACH, C., California. Gladioli for trial.
- SALMON, C. E., Reigate. *Primula heucherifolia*; *Myosotis* sp.? Miscellaneous plants.
- SAPPORO BOTANIC GARDEN, Japan. Collection of seed.
- SASS, H. P., Nebraska. Irises for trial.
- SCARLETT, G., Stoke-on-Trent. Potatos for trial.
- SCARLETT, Messrs., Musselburgh. Cabbages, Celeriac, for trial.
- SCOTT, A. H., U.S.A. Iris for trial.
- SEWELL, A. J., Weybridge. Seed of *Gentiana Lagodechiana*.
- SHEPHERD, Messrs., U.S.A. Petunias for trial.
- SIMMONDS, A. Bulbs.
- SIMPSON, Messrs. W. H., Birmingham. Peas, Savoy Cabbages, Kohl Rabi, Celeriac, spring sown Cabbages, Sweet Sultan, Viscaria, Nemophila, Cosmea, Lavatera, Linum, Nemesia, Nigella, Potatos, Aquilegias, for trial.
- SMURTHWAITE, Messrs., North Shields. Cabbage for trial.
- SPEED, H. J., Evesham. Peas, Cabbages, Savoys, for trial.
- STAIR, The Rt. Hon. Lord, Castle Kennedy. *Primula Bulleyana* hybrids; Fig 'Castle Kennedy.'
- STEPHENSON CLARKE, Col. Miscellaneous flower seeds.
- STERN, Major F. C., Goring-on-Sea. *Solanum aviculare*, Iris 'Sybilla,' *Allium Murrayanum*, *Sisyrinchium* sp.
- STEVENSON, J. A., Washington, U.S.A. *Iris* sp. (seed of).
- STOKES, J. E. H., Hereford. Seed of *Piptanthus nepalensis*.
- STORRIE & STORRIE, Messrs., Perth. Aquilegias, Parsley, for trial.
- STREDWICK, J., St. Leonards-on-Sea. Dahlias for trial.
- STUART & MEIN, Messrs., Scotland. Aquilegias for trial.
- TAYLOR, Miss, Reigate. *Primula sataniensis*.
- TAYLOR, The Misses, Reigate. *Aubrietia Gurgedye*; *Viola gracilis citrina*.
- TAYLOR, W., Shrewsbury. Peas for trial.
- TENISON, Major, Guildford. *Colletia cruciata*.
- THYNE, Messrs., Dundee. Dahlia for trial.
- TIFLS BOTANIC GARDEN, Russia. Collection of seeds.
- TODD, E., London. *Campanula isophylla*.
- TOLKOWSKY, S., Tel-Aviv. Miscellaneous seeds.
- TOOGOOD, Messrs., Southampton. Azaleas.
- TRESEDER, W., Cardiff. Dahlias for trial.
- TRINITY COLLEGE BOTANIC GARDEN, Dublin. Miscellaneous seeds.
- TROTTER, R., Ockley. *Saxifraga* 'Rob Roy'; *Gentiana Augulosa*; *Arnica montana*; *Campanula spicata*; *Cordylone excelsa erythroclada*.
- TROWER, A., Redhill. Plant of Hyacinth with parti-coloured spike.
- TUBERGEN, Messrs. C. VAN, Haarlem, Holland. Gladioli, Dahlias, Freesias, Kniphofias, for trial.
- TUBINGEN BOTANIC GARDEN. Collection of seeds.
- TURNER, Messrs. C., Slough. Dahlias for trial.
- TURNER, Mrs., Betchworth. Seed of *Daphne Mezereum alba*.
- UNIVERSITY BOTANIC GARDEN, Algeria. *Cyclamen africanum*; *Salvia morocana*; *Salvia Monroana*.
- UNKNOWN DONOR. Plant of *Orchus sambrecina*.
- UNWIN, Messrs., Histon. Peas for trial.
- UPPSALA BOTANIC GARDENS, Sweden. Collection of seeds.
- UTRECHT BOTANIC GARDEN. Collection of seeds.
- VANDERSCHOOT, Messrs., Holland. Kniphofias for trial.
- VAN DE WEYER, W. J. B., Dorchester. Freesia for trial.
- VAN ROSSEM, Messrs., Naarden. Roses for trial.
- VEITCH, Messrs. R., Exeter. Nerines, Calandrinia, Sweet Sultans, Portulaca, Nemophila, Helichrysums, Liniums, Cosmeas, Nemesias, Nigella, Viscaria, Cabbage, Savoys, Celeriac, Peas, Aquilegias, Gladioli, Vine, for trial.
- VERKHNE TORGONY RIADY, Moscow. Collection of seeds.
- VICEREGAL GARDENS, Simla and Delhi. *Lilium Thomsonianum* and *Lilium polyphyllum*.
- VICKERS, V., Royston. Aquilegias for trial.
- VIENNA BOTANIC GARDEN, Austria. Miscellaneous seeds.
- VILMORIN ANDRIEUX, Messrs., Paris. Collection of seeds; Iris for trial.
- WAGENINGEN BOTANIC GARDEN, Holland. Miscellaneous seeds.

- WALKER, Col., Budleigh Salterton. *Hypericum lanceolatum*.
WALL, C., Bath. Aquilegias for trial.
WARBURG, Sir OSCAR, Headley. Miscellaneous plants and seeds.
WATERER & CRISP, Messrs., Twyford. Iris for trial.
WATERSTON, J., Arnan. *Mertensia maritima*.
WATKINS & SIMPSON, Messrs., Covent Garden. Cabbages, Celeriac, Kohl Rabi, Savoys, Nigella, Calandrina, Linum, Lavatera, Portulaca, Acrocinum, Helichrysum, Cosmea, Nemesia, Viscaria, Nemophila, Rhodanthe, Statice, Centaurea, Peas, Aquilegias, Papaver, for trial.
WAVEREN, Messrs. VAN, Hillegom. Freesia for trial.
WAY, Rev. Dr. Large-flowered *Primula viscosa* collected in Macuguaga Valley.
WEBB, Messrs. C., Stourbridge. Cabbage, Aquilegias, Gladioli, for trial.
WELLINGTON EDUCATION BOARD, New Zealand. Seed for identification.
WHEELER, J. C., Gloucester. Aquilegias, Cosmeas, Cabbages, Peas, for trial.
WHEELERS, Messrs., Warminster. Peas, Savoys, Cabbages, for trial.
WILLIAMS, Dr., Horsham. Miscellaneous plants.
WILLIAMSON, Mrs., London. Seeds for identification.
WOISLOWITZ BOTANIC GARDEN. Miscellaneous seeds.
WOOLMAN, H., Birmingham. Dahlias for trial.
YARDE, Messrs., Northampton. Peas for trial.
YELD, G., Gerrards Cross. Plants of *Hemerocallis*.
ZURICH BOTANIC GARDEN, Switzerland. Miscellaneous seeds.
ZWAAN & DE WILJES, Messrs., Holland. Peas, Savoys, Cabbages, for trial.
ZWAAN & VAN DER MOLEN, Messrs., Holland. Miscellaneous vegetable seeds, Aquilegia, for trial.

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